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...XT WEEK . . .

Cupping of Thick Steel Blanks During Cold Forming

How Chromium Plating Affects Fatigue Life of Aircraft Steels

Producing Intricate Parts Via Vacuum Investment Casting

Production of Stainless Steels—II

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 18 OCTOBER 31, 1949

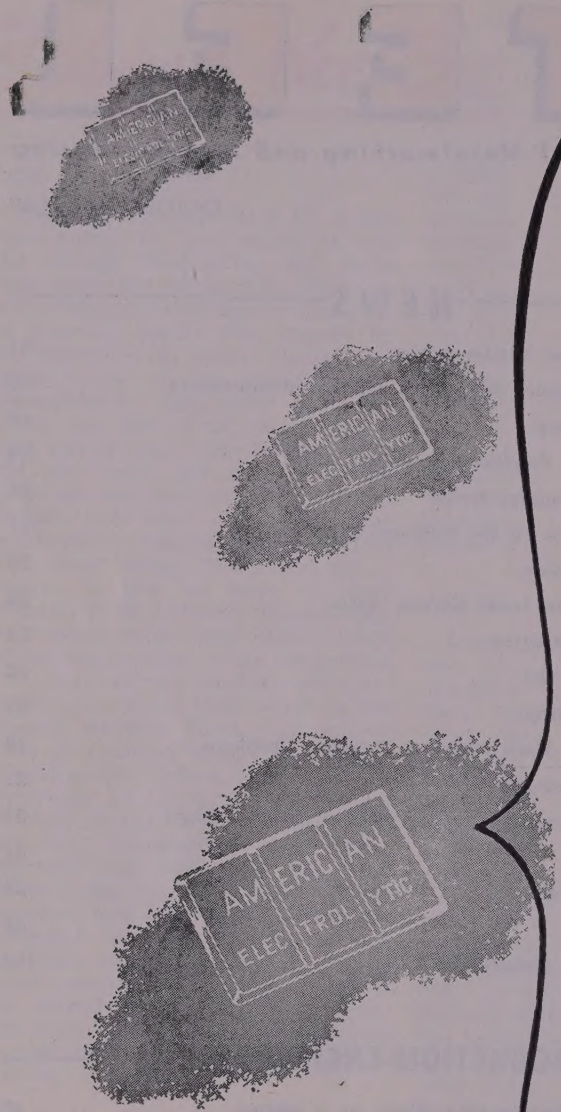
NEWS

PRODUCTION-ENGINEERING

MARKETS

Editorial Index available semiannually; STEEL also is indexed regularly by Engineering Index Inc., 29 West 39th St., New York 18

★ Denotes Regular Features.



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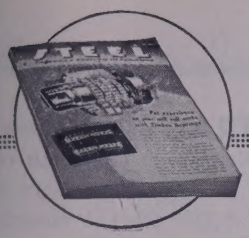


October 31, 1949

Proves Need of T-H

Early last September when Ford Motor Co. was threatened with a strike, the Detroit Board of Commerce ran full-page ads in the newspapers calling upon union and company to consider carefully the full costs of a shutdown before permitting a strike to occur. The ads went into detail as to the losses incurred as a result of the 23-day Ford strike last May and concluded: "How much better it would be to compute the costs in advance—the net cost to everyone —before the suffering caused by strikes is actually experienced!"

Today it is becoming increasingly apparent that millions of persons affected by the coal and steel strikes wish they had had an opportunity not only to know the net cost of the strikes in advance but also to have a more effective voice in deciding whether or not a strike would be desirable. Newspapers in coal and steel districts currently are publishing numerous letters-to-the-editor from employees who complain that they were given no opportunity to vote on whether to strike or not to strike.

Presumably the voice of union members is expressed through the medium of an executive board whose members are supposed to follow the wishes of a majority of the members. Even assuming that the system works on a truly representative basis, there is one serious flaw in the manner in which a decision to strike is reached. The decision usually is made before the points at issue are clearly defined in the minds of the rank and file of union members.

This certainly was true in the steel strike. Members of unions whose officers were on the point of signing contracts with individual companies on terms much more favorable than those demanded by Mr. Murray on an industry-wide basis certainly would not have sanctioned a strike if they had been given an opportunity to vote.

The present unfortunate experience proves conclusively that better machinery should be provided to permit the will of persons affected by strikes to be expressed more effectively. In reality, the sorry mess shouts to heaven for something like the Taft-Hartley Act, which in many ways protects union members and the public against abuses by union dictators.

* * *

MORE FLEXIBLE PRICING: All signs point to a more liberal attitude toward pricing methods on the part of the Federal Trade Commission. The change of heart by a majority of the commissioners stems from their realization that the O'Mahoney bill as passed by the House, if passed by the Senate and signed by the President, would strip FTC of its authority over pricing systems.

Commissioners usually are human enough to want to retain their cherished prerogatives. Therefore FTC between now and the time Congress convenes will do everything possible to prove that the remedies provided by the O'Mahoney bill are not necessary. By liberalizing its policies on pricing methods, FTC hopes to demonstrate to the Senate that there is no need to pass the O'Mahoney bill.

This "about-face" attitude is reflected in the pending agreement between commission and steel company attorneys in the case against the former multiple basing point, delivered price system. Under the proposed settlement mills will be required to quote f.o.b. mill prices and to sell at these prices when so requested by the consumer. Mills can absorb freight except when

(OVER)

such absorption "unlawfully lessens competition." Each producer would establish his own extras without reference to his competitors.

If this agreement goes into effect, its more liberal provision on freight absorption will make for greater flexibility in pricing, which will benefit sellers and buyers alike. —p. 24

* * *

OVERDUE STREAMLINING: Purchasing agents who buy for federal, state and municipal governments are becoming conscious of the fact that many private suppliers shy away from desirable public business because its procurement often involves too much inconvenience and too many complications. At the fourth annual conference and products exhibit of the National Institute of Government Purchasing, held in Cleveland last week, government purchasing personnel stressed the importance of streamlining their operations so as to attract more private suppliers.

The number of sales managers in the metalworking industries who will welcome this praiseworthy reform is legion. Every taxpayer should hail it with delight. Everybody will benefit by a simplification of the endless and senseless routines which have characterized much of the procurement procedures of government units. —p. 21

* * *

CONSERVATION PIONEERS: As our nation grows older, it is inevitable that agriculturalists and industrialists will discover that they have many interests in common. For instance, the upland farmer who sees his precious top soil washed away by erosion will understand the annoyance of the manufacturer in the valley whose operations are threatened by lack of water or by deposits of silt in the river or harbor which affords water transportation to his plant.

Sooner or later both will be attracted to the possibilities of conservation. Some industrialists already have seen the light. Among the pioneers in this respect are Fred H. Chapin, president of National Acme Co., and Mrs. Chapin, who recently deeded a forest acreage to the state of Ohio to save it from the devastation of a ruthless lumbering operation.

Soil erosion and constantly lowering water tables are a definite threat to industry in many sections of the country. Industrial management can well afford to team up with farmers to combat this menace. —p. 50

OUR NATIONAL TRAGEDY: Resignation of Dr. Edwin G. Nourse as chairman of the President's Council of Economic Advisers is one of the drab aspects of the present chaotic situation in Washington. Here is a man of unquestioned ability who is forced to give up his post because he has found that under the present regime economics must be prostituted to the exigencies of raw politics. He simply cannot condone the questionable policies his chief is pursuing.

The loss of one good man in government service ordinarily would not occasion much comment. It happens frequently. But when one sees capable men like Doctor Nourse retiring in disgust at the same time men of mediocre abilities such as Mon Wallgren are going into government service with reluctant Congressional approval, one wonders what will be the end result. How many really capable men in Washington do you think are in full sympathy with President Truman's policies? Our guess is that virtually every well qualified man in a responsible government post is deeply concerned about the influx of incompetent political hacks. It is a national tragedy. —p. 24

* * *

A CLASSIC IN BREVITY: Fifteenth in this publication's series of articles on the fundamentals of steelmaking is "Production of Stainless Steel," the first installment of which appears in this issue. The author is B. H. DeLong, vice president and technical director of Carpenter Steel Co., whose eminent career in metallurgy spans the entire era of stainless steel to date.

In introducing his subject, Mr. DeLong refers to the pioneer work of Harry Brearley and quotes claim 4 of his U. S. Patent 1,197,256 dated Sept. 5, 1916: "A hardened and polished article of manufacture composed of a ferrous alloy containing approximately C—0.30 per cent, Mn—0.30 per cent and Cr—13.0 per cent." Mr. DeLong points out that this patent not only is historical because of its significance, but "it should remain as a classic example of literary brevity. It contains only 90 lines."

Anybody who has delved through patents or who reads the Patent Gazette must realize that a 90-line patent is a rarity. —p. 64

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STRIKES— Presidential intervention in the steel and coal strikes may come soon (pp. 17, 18). One million workers will be idled by the steel walkout alone by Nov. 1 and 5 million if it lasts until Dec. 1. If the steel dispute should end tomorrow, 8.5 million tons of ingots and castings will be lost, counting the four weeks of strike and the time that will be needed to regain normal production.

BUSINESS WEATHER— Worried about the economic outlook? Steel company earnings were down in the third quarter even though that period was unaffected by strikes (p. 19). But good prospects are seen for capital equipment manufacturers (p. 20), government suppliers (p. 21) and specialists in gas industry construction (p. 22). Machinery makers expect a fair year ahead; they will stress cost-cutting potentialities of new equipment. Government purchasers who buy billions of dollars worth of goods and services annually are streamlining their methods to attract more private suppliers. Anticipated construction expenditures for gas utilities total $3.5 billion for 1948-1952.

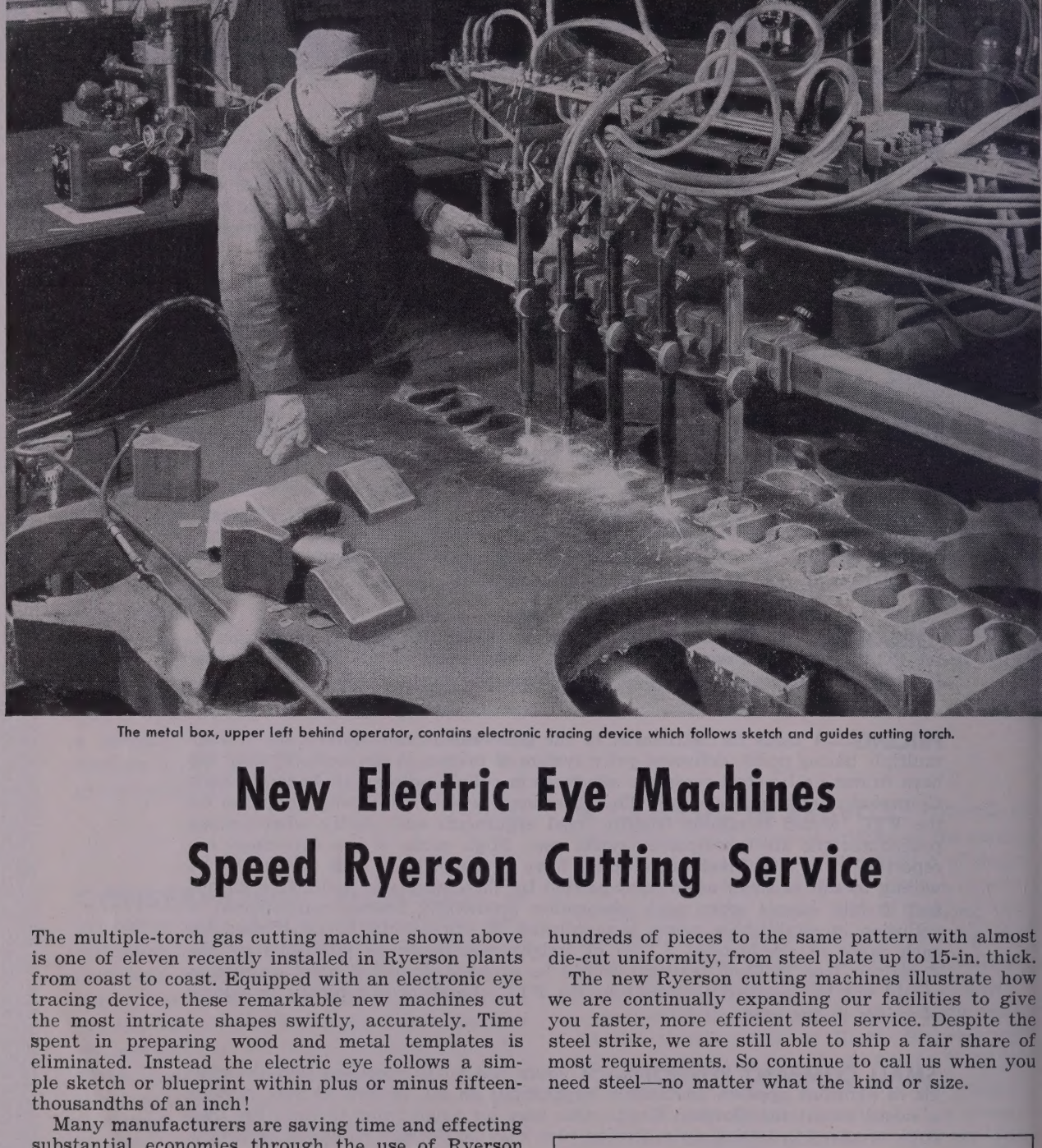
COPPER— Another significant business barometer may be this: Domestic copper consumpition in September hit the highest peak since a year ago (p. 21). October figures will at least equal those of the previous month, despite the wet blanket thrown on the economy by strikes.

FOREIGN— What may be far more than just another government report is the ECA study which warns that the U. S. must import $2 billion more in goods annually if Western Europe is to survive economically (p. 23).

PRICING— A basis for settlement of the government suit against the former multiple basing point, delivered-price system of pricing in the steel industry has been drawn up by steel company attorneys in collaboration with Federal Trade Commission attorneys (p. 24). The agreement, which if formally approved by the FTC, would terminate lengthy legal arguments and clarify what pricing procedures the steel companies could use. High spots of the agreement are reported to be: 1. Steel mills would have to quote f.o.b. mill prices and be willing to sell at them when so requested by the consumer; 2. mills could absorb freight except when such absorption unlawfully lessens competition; 3. collusion in establishing prices is prohibited; 4. prices must be established for each point of production; 5. use of freight rate books as published by the American Iron & Steel Institute would be prohibited; and 6. steel companies would not be required to admit to the FTC charge of conspiracy in setting of prices in the past.

SMALL COMPANY PENSIONS— If yours is a small company and the puzzle of pensions appears unsolvable, suggestions on pp. 28 and 29 may provide a sword to cut the Gordian Knot. One way for small firms to meet the high costs involved in setting up a pension plan may be through co-operative action.

HERE AND THERE IN INDUSTRY— Foreign business in machine tools dropped to a low for the year in September because of currency devaluations (p. 20) . . . Stockpiling of strategic and critical materials will be stepped up for the remainder of fiscal 1950 (p. 26) . . . An alltime record year in auto output is certain despite the steel strike (p. 31) . . . Cost cutting with a bonus in better employer-employee relations is seen resulting from a properly administered suggestion system (p. 27) . . . United Aircraft Corp. saved money for its new experimental jet engine testing laboratory when officials short-stopped power generating equipment to have been junked from Navy cruisers and war-surplus, lend-lease vessels . . . Robert W. Wolcott has been named chairman of Lukens Steel Co. and Charles Lukens Huston Jr., formerly vice president and executive assistant to the president, will succeed him as president . . . Apex Electrical Mfg. Co., Cleveland, reports its third quarter sales of home appliances were 32 per cent above those of the second period.



The metal box, upper left behind operator, contains electronic tracing device which follows sketch and guides cutting torch.

New Electric Eye Machines Speed Ryerson Cutting Service

The multiple-torch gas cutting machine shown above is one of eleven recently installed in Ryerson plants from coast to coast. Equipped with an electronic eye tracing device, these remarkable new machines cut the most intricate shapes swiftly, accurately. Time spent in preparing wood and metal templates is eliminated. Instead the electric eye follows a simple sketch or blueprint within plus or minus fifteen-thousandths of an inch!

Many manufacturers are saving time and effecting substantial economies through the use of Ryerson flame-cutting. With electric eye machines rounding out a complete flame-cutting service, your Ryerson plant produces an endless variety of shapes from strong rolled steel. To mention only a few—circles, rings, wrenches, flanges, crankshafts, weldment parts, cams—many more. The result: clean, accurate edges whether mild steel, high carbon, alloy or stainless steel is used. And your Ryerson plant can produce hundreds of pieces to the same pattern with almost die-cut uniformity, from steel plate up to 15-in. thick.

The new Ryerson cutting machines illustrate how we are continually expanding our facilities to give you faster, more efficient steel service. Despite the steel strike, we are still able to ship a fair share of most requirements. So continue to call us when you need steel—no matter what the kind or size.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished.
SHAFTING—Cold fin., ground & polished, etc.
STRUCTURALS—Channels, angles, beams, etc.
TUBING—Seamless & welded mechanical & boiler tubes.
STAINLESS—Allegheny bars, tubing, plates, sheets, etc.
PLATES—Sheared & U. M., Inland 4-Way Floor Plate.
SHEETS—Hot & cold rolled, many types.
MACHINERY & TOOLS—METAL WORKING EQUIPMENT

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CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISC

STEEL
A PENTON PUBLICATION

wait White House Strike Action

Stage ready for President to step into coal and steel stoppages. Mediation expected to be first move in steel, with seizure of mills as a last resort

TCH for White House intervenin the steel and coal strikes as ts of the twin stoppages fan out ugh the economy.

ediation efforts of Cyrus S. Ching his staff have come to naught. management and union chiefs in adamant.

creasingly, both sides are lookfor a move by the administration et the disputes off dead center.

sses Pile Up — Production and oyment losses caused by the es to date are staggering. They are mounting in geometrical r than arithmetical progression. ireds of metalworking companies will be forced to close down for of steel.

ready 5.7 million tons of ingot uction has been lost. If the steel e were to end at once, between and three million additional tons utput would be lost before faes resumed normal production.

ould the steel strike continue to 1, five million workers would be and the loss in steel production d exceed 14 million tons.

e 6-weeks-old coal strike is idling 00 miners, more than 100,000 ad employees.

mpromise Offer Anticipated — dential intervention in the steel e is expected to appear first as fer of White House mediation at h a compromise settlement would ggested. One such compromise h might be acceptable would be e basis of the industry contributhe 10 cents an hour toward the l security package as recomled by the fact-finding board with pulation that the cost of any e expansion of the package d be shared by the workers.

zure as Last Resort — Should e House mediation fail, seizure eel mills and coal mines will beo a more distinct possibility.

l Output Losses Mount

arly 5.7 million net tons of steel s and castings have thus far lost in the four weeks of the strike. Since the beginning of valkout Oct. 1, the industry has been operating at rates ranging from 7.5 to 9.5 per cent of capacity.

This table gives estimated annual productions assuming the strike will end at various dates. Although the dates are figured through Dec. 15, it is unlikely the strike will last that long. Calculations are based on these assumptions: That the yearly output would have been 85 million net tons if there had been no strike; that the industry would operate at 85 per cent of capacity, the rate as of Sept. 30; that 2.8 million tons will be lost from the time the strike ends until full production is resumed.

Figures in table are in millions of net tons.

IF:	Yearly Output	Loss
No strike	85.0	—
It ends Nov. 1	76.5	8.5
It ends Nov. 15	73.7	11.3
It ends Dec. 1	70.9	14.1
It ends Dec. 15	68.1	16.9

Time Lag When Strike Ends

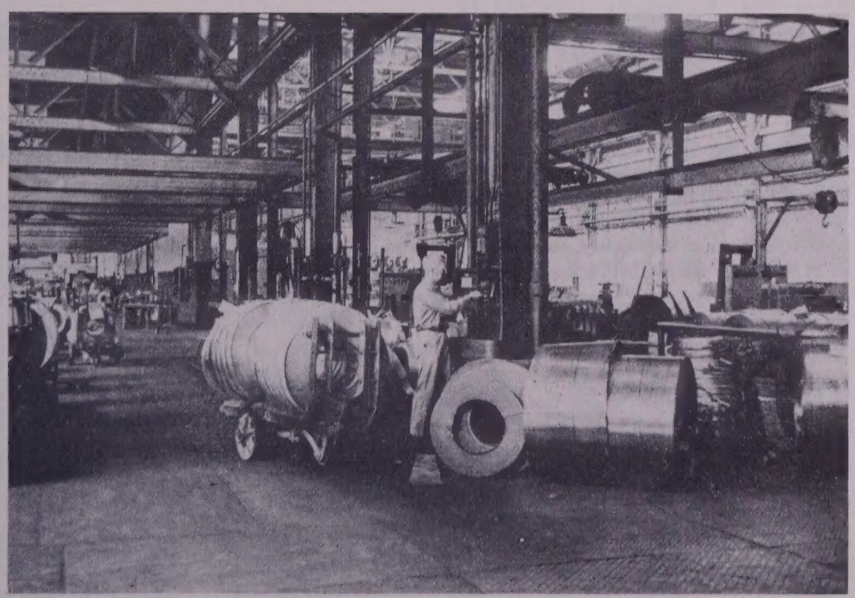
Don't expect resumption of large-scale steel deliveries even a week after the strike ends. It may take four to five weeks after the walkout is over before you will receive shipments of some finished products like cold-rolled sheets.

After the 27-day steel dispute which began Jan. 21, 1946, ingot and castings production was only 16 per cent of capacity one week following settlement. Within three weeks basic production was nearly normal.

Under ideal conditions coke ovens can produce coke in quantity one week after resumption of operations. Three to four days are required to get blast furnaces into production, assuming they are not allowed to become cold. From two days to as much as three weeks are needed to get open hearths at full capacity operation. Under the best conditions electric furnaces can be restored to production within 12 hours after charging. It may require two to three weeks to get soaking pits into full operation. Rolling mills can resume operation quickly if undamaged. Slow resumption at virtually all plants is necessitated by inspection and repair work, plus preliminary administrative actions.

The average steel consumer didn't get back to full production for six weeks following the basic steel settlement in 1946. Even though he can get steel quickly from the mill, the user needs from three to ten days before he is organized again for capacity output.

Automakers estimate that four to six weeks will elapse following the present steel strike's end before they



LONE ELECTRICIAN FIGHTS RUST IN STRUCK WAREHOUSE
. . . humidity controls protect stock at American Steel & Wire

can again assemble at full tilt. Appliance producers estimate five weeks.

Asks Board's Recall

Recall of the steel fact-finding board to clarify its recommendations on good faith, individual collective bargaining is being asked by several steel companies. The union has refused to bargain on a company-by-company basis, unless the ultimatum of noncontributory pensions and social insurance is accepted in advance.

William H. Colvin, president, Crucible Steel Co., is asking Cyrus S. Ching, director of the federal mediation service to "find out from the board itself what it actually means by good faith, individual collective bargaining."

Dr. Carroll R. Daugherty, chairman of the fact-finding board, says the board is willing to take a second look at the issue if requested to do so by the industry and the union.

Mr. Colvin believes "a way to end this strike is for the union to permit its locals the right and privilege of free collective bargaining with individual steel companies."

Other specialty steel companies support Mr. Colvin's recommendation. Superior Steel Corp., Columbia Steel & Shafting Co., Latrobe Electric Steel Co. and Babcock & Wilcox Tube Co. last week were preparing to make similar requests.

Not Pinched Yet by Strike

Current production schedules of only 15 per cent of the nation's construction equipment manufacturers are pinched by the steel strike.

This is revealed in a survey by Associated Equipment Distributors, Chicago, national trade association of the construction equipment industry.

But continuation of the strike beyond Dec. 1 probably would force a majority of the association's members to reduce present production schedules by 50 per cent or more during December. Thirty-two per cent of the manufacturers participating in the survey indicate their December production probably would not be affected. An additional 10 per cent probably would cut back less than 50 per cent.

An overwhelming majority of construction equipment manufacturers intend to continue operating at their present level as long as possible, rather than gradually curtailing production, the survey reveals.

Can Continue 30 More Days

Operations of Fruehauf Trailer Co. could continue another 30 days before they would be curtailed by effect the steel strike.

The company is working on a million backlog of orders, one of largest it has had in years.

Coal Too Costly

JOHN L. Lewis, says Harry R. McQuaid, electric steel specialist of Cleveland, has had more effect on the steel industry than anyone else.

Mr. Lewis, according to Mr. McQuaid, has increased the cost of coal so much that coke and consequently pig iron are so costly that it is cheaper to make steel in electric furnaces than in open hearths. Steel companies, Mr. McQuaid told the Metal Treating Institute, can operate electric furnaces economically enough to furnish steel in local areas such as Minneapolis and New England where scrap is available.

He contends steel mills in Birmingham are making steel cheaper with electric furnaces than big steel companies are able to produce it.

Salaries Cut by Strikes

The steel strike is bringing temporary pay cuts for salaried ployees of steel companies.

Jones & Laughlin Steel Corp lowering salaries Nov. 1, the re tions ranging from 20 per cent employees whose services will be quired full time to 50 per cent those whose services cannot be ized during the strike. Elected ficers of the company are affe also by the reductions.

Republic Steel Corp. in laying employees not on strike is ma partial payments of salaries. of the company's employees no strike are not working full time

Steel Plant Sale Postponed

SCHEDULED auctioning of steel facilities operated by Steel Pro ers Inc., in the Toronto, O., plan Follansbee Steel Corp., previously for Oct. 24 in Pittsburgh, has postponed indefinitely.

Open-Hearth Plant Started

CONSTRUCTION is underway \$12 million open-hearth plant Armco Steel Corp. in Middlet O. Plant will consist of three ton open-hearth furnaces capabl producing 400,000 tons of steel in annually and is the start of a million expansion program to spread over the next few years.

Loftus Engineering Corp., burgh, designed and will build basic brick furnaces, which will oxygen extensively. Feature of

Two Score Companies, Employing Total of 47,000, Sign with United Steelworker

Forty-odd metalworking and steel producing companies have signed contracts with the United Steelworkers-CIO, granting union demands for pensions and social insurance, union officials report. Affected are 47,715 employees, representing less than 5 per cent of the union's membership in the steel and metalworking industries.

Companies which the union says have signed are:

	Number of Employees
Crompton-Knowles Loom Works, Worcester, Mass.	2,100
Lebanon Steel Foundry Co., Lebanon, Pa.	750
Connors Steel Co., Birmingham, Ala.	500
Pacific States Steel Corp., Niles & Pittsburg, Calif.	700
Judson Steel Corp., Emeryville, Calif.	300
Massey-Harris Co., Buffalo, N. Y.	2,000
Heppenstall Co., Pittsburgh	900
Central Iron Co., Harrisburg, Pa.	1,100
Kelsey-Hayes Co., McKeesport, Pa.	650
H. H. Robertson Co., Ambridge, Pa.	1,000
Adamson Tank Car Co., E. Palestine, O.	150
Ing-Rich Metal Co., E. Palestine, O.	150
Pittsburgh Coal Washer, Ambridge, Pa.	150
Portsmouth Steel Co., Portsmouth, O.	4,000
Kaiser Steel Co., Fontana, Calif.	3,500
American Can Co.	14,000
Duriron Co., Dayton, O.	500
Wickwire Bros. Co. Inc., Cortland, N. Y.	
Pittsburgh Steel Foundry, Glassport, Pa.	1
Ft. Pitt Foundry, McKeesport, Pa.	
Blaw-Knox Co.	4
National Alloy Steel Div., Blawnox, Pa.	
Union Steel Castings Div., Pittsburgh	
Pittsburgh Rolls Div., Pittsburgh	
Lewis Foundry & Machine, Groveton, Pa.	
Roebling Wire Rope Co., Trenton, N. J.	3
Copperweld Steel, Glassport, Pa.	1
Lawson Manufacturing Co., Pittsburgh	
Palley Manufacturing Co., Pittsburgh	
Tracey Manufacturing Co., Pittsburgh	
Heyl & Patterson Co., Pittsburgh	
Pittsburgh Gear Mfg. Co., Pittsburgh	
Pfaudler Co., Rochester, N. Y.	
Eastern Stainless Steel Co., Baltimore	
Lee-Norse Co., Charleroi, Pa.	
Reliance Steel Products Co., McKeesport, Pa.	
Kerotest Mfg. Co., Pittsburgh	
Hanlon-Gregory Co., Pittsburgh	
McDowell Mfg. Co., Pittsburgh	
Tri-Lok Co., Pittsburgh	
Union Electric Steel Castings Co., Carnegie, Pa.	
Stanley Mining Co., Eveleth, Minn.	
The Townsend Co., New Brighton, Pa.	
National Radiator Co., Johnstown, Pa.	
Parkersburg Steel Co., Parkersburg, W. Va.	
Total	47

ign is an elevator charging arrangement for reducing scrap charging time.

Steel Earnings Drop

Third quarter reports show effect of mid-summer recession. Profits off 10 per cent

D-YEAR business recession is reflected in reduced third-quarter net nings of steel producers.

ine producers representing 70 per of the nation's ingot capacity ed 10 per cent less in the third rter than in the second. Their l net earnings in the third period e $94,686,353, compared with 5,691,715 in the second quarter, the accompanying table shows.

nly one of those nine companies orts third-quarter earnings exled those of the second quarter. company shows a net loss.

easing in demand for steel cut nation's steel ingot production the third quarter to the lowest in some time, 78.8 per cent of acity.

ecause of the high production s of the first two quarters, 101.5 cent in the first quarter and per cent in the second quarter, earnings then were sufficiently to offset the poorer earnings formance in the third quarter and e the total for the first nine ths of 1949 well ahead of that the first nine months of 1948.

ery little of the decline in the d quarter is a result of the steel ke, because operations in preparon for the Oct. 1 strike did not t until the last few days of Septber.

GM Introduces Three Diesels

INTRODUCTION of three diesel switching locomotives by Electro-Motive Division, General Motors Corp., LaGrange, Ill., constitutes its third major postwar product improvement program. New models are: 1200-hp yard switcher which supersedes the 1000-hp model in use since 1938, 800-hp yard switcher designed to cover the range of service formerly assigned to other 1000-hp switchers and a 1500-hp road switcher or general purpose locomotive.

The 1500-hp unit is in production, the 1200-hp unit will be in production before yearend and deliveries of the 800-hp switcher are planned for late next summer. The division also is now in production of the high speed 2250-hp diesel passenger locomotive announced earlier this year.

Electro-Motive Division's program for expanded locomotive production is practically complete. In 1950 it will be able to build 2000 locomotive units or more than 2.5 million hp per year. This total is double that of two years ago.

Expands Aluminum Plant

AN $8 million expansion program is under way at Reynolds Metals Co. plant at Listerhill, Ala. Completion is scheduled for Jan. 1.

Included in the expansion are installation of new foil mills to operate at a speed of nearly a mile of foil a minute, new annealing ovens, many modern high-speed processing units, two new aluminum-covered buildings giving an additional 200,000 square feet of floor space, a large cable plant for increased production of steel reinforced aluminum cable for electrical conductor, and additional rod rolling facilities, some of which were transferred from another Reynolds plant.

Publicity for Finances

Needed if industry is to withstand labor's attacks, metal trades group hears

FINANCIAL and other economic facts on business must be presented to the public if industry is to withstand attacks by labor. That was the theme of speakers at the golden anniversary convention of the National Metal Trades Association in Chicago, Oct. 26-28.

Willard F. Rockwell, board chairman of Standard Steel Spring Co., says: "The people in this country are not stupid. They are simply not informed." If a company advertises its financial and economic situation as well as it publicizes the facts about its product, Mr. Rockwell believes, the company will get far more sympathetic public support in its labor and community relations.

Common Ground for Management, Employees—Management must find a common ground with employees on economic subjects, says Walter E. Johnson, vice president of Commercial Shearing & Stamping Inc. Industry must convince employees that in any successful company the workers and the company make money with each other, not out of each other. Businessmen must convince unions that it is as "illogical to abolish capitalism because it hasn't abolished poverty as it is to abolish churches because they haven't abolished sin."

Steel Producers' Net Earnings

	3rd Qtr. 1949	2nd Qtr. 1949	3rd Qtr. 1948	1st 9 Mos. 1949	1st 9 Mos. 1948
ited States Steel Corp.	$39,171,144	$44,123,595	$34,599,132	$133,223,409	$88,042,150
lehem Steel Corp.	23,019,799	26,749,029	22,584,752	82,898,402	53,183,858
ublic Steel Corp.	9,870,703	10,178,544	12,874,398	35,347,875	29,812,788
es & Laughlin Steel Corp.	4,870,019	5,300,004	8,757,416	20,038,918	20,249,317
ional Steel Corp.	10,047,905	11,115,132	11,175,400	35,916,812	27,201,435
nd Steel Co.	7,555,103	7,033,304	9,811,133	23,842,637	24,819,526
ary Electric Steel Co.	115,498*	299,700	591,303	1,206,254	1,689,656
n Wood Steel Co.	62,920	386,565	1,109,534	1,835,172	2,383,890
perweld Steel Co.	204,258	505,842	1,304,188	1,425,737	3,031,384
Totals	$94,686,353	$105,691,715	$102,807,256	$355,735,216	$250,414,004
ISHING CAPACITY ONLY					
e Steel Co.	$929,221	$1,111,680	$1,660,269	$3,327,749	$5,102,269
mas Steel Co.	203,370	257,933	403,008	929,945	1,357,492
IRON CAPACITY ONLY					
rlake Iron Corp.	$1,205,474	$1,199,842	$1,268,681	$4,162,509	$3,638,878
s-Sheffield Steel & Iron Co.	403,148	512,402	639,992	1,790,891	1,778,555

* Net loss.

Outlook Good for Capital Equipment

Steel, coal strikes hit machinery sales, but fair business seen when disputes end for those manufacturers whose products will cut operational costs

STEEL and coal strikes are blocking orders for new capital equipment. End of the disputes should release a moderate flow of new business in the next year for those production machinery makers whose equipment will cut costs.

This is the outlook seen by speakers at the semiannual meeting of American Gear Manufacturers Association in Chicago, Oct. 24-26. Fred W. Walker, president of the association and executive vice president of Philadelphia Gear Works, pointed out that the index of the gear business began a trend upward in August after hitting a low point in July. He emphasized the importance of the standards activities carried on by the association and urged that engineering committees and staff facilities be strengthened to further this work.

Equipment Due for Replacement—Dexter Keezer, McGraw-Hill economist, says the industrial equipment of America is not in too good shape. A vast amount of over-age and worn out industrial machinery is due for replacement.

Highlights of the technical sessions were papers on new methods for testing heavy duty gearing, by R. P. Van Zandt and B. W. Kelley of Caterpillar Tractor Co., and on pre-shave cutting tools, by A. D. Moncrieff, Michigan Tool Co.

Tractor Methods Changed — With growing competition, tractor design and testing methods have changed greatly. Originally the machines were built as ruggedly as space and weight limitations would allow—then were run on the proving ground where numerous "bugs" came to light and were eliminated. After that customers discovered the rest of the "bugs," which the service and engineering departments corrected at much inconvenience to the customer.

Unsatisfied customers plus stiffening competition have forced basic research and scientific development into the tractor business. New designs must be right the first time. Hence the elaborate and practical laboratory test methods, even more severe than field tests but much easier to interpret. Out of these have come discoveries as to wear and breakdown of heavily loaded gears and metallurgical, design and manufacturing techniques to overcome these difficulties.

Gear Shaving Studied—A. D. Moncrieff, assistant chief engineer, Michigan Tool Co., has delved into improving the quality and speed of gear shaving—and the useful life of shaving cutters—by revising methods and tools used in cutting gears which are to be finished by the shaving methods. Heretofore the general supposition was that all that had to be done preliminary to shaving was simply to cut a gear using standard tools but leaving on the work a small amount of extra stock to be shaved off.

Mr. Moncrieff has done work in analyzing exactly what shaving cutters should be called upon to do to produce a commercially perfect gear. Then he has gone back to the preliminary cutting to discover where and how much stock should be left on for shaving—then has redesigned the preliminary cutting tools to leave on only the minimum amount and that only where it is needed to blend the working shaved areas into the other areas on the teeth.

This has resulted in a great amount of revised and special geometry, both of "roughed out" teeth and tools for roughing them out. Detailed study of this paper is recommended to all tool and production engineers who are involved in shaving of gears in mass production lots.

Foreign Business Hit

Foreign business in machine tools dropped to a low for the year in September because of European currency devaluations, but the long term effect is not yet clear. Machinery builders in general aren't climbing out on any limbs to say what will happen, but many say September's drop was due to a momentary panic.

A lot depends on the action taken by the Economic Cooperation Administration. If ECA business holds up near the $72 million originally allotted then foreign business will be normal. Should this figure be cut then the foreign market will suffer. Since ECA is committed to European reconstruction without regard to American business, some builders are uneasy.

American machinery is at a disadvantage pricewise in European markets. Even before the mass currency devaluations American m chinery was higher priced than Eu pean machinery with the same rati

Need Modern Machinery — T Berna, general manager, Natio Machine Tool Builders' Associati points out that this does not ma American sales impossible. Europe metalworking companies are still dire need of modern machinery. I liveries of British machine tools a extended for a one to three ye period, and most firms on the con nent can afford to pay higher pric for immediate delivery and still co out ahead, he says.

Many American machinery bui ers also believe prices of Briti machine tools will go up in the ne future to the point where the form differential will return. Thus t competitive position of U. S. builde will be improved.

Few Cancellations — Machine t builders say they have had few ca cellations from foreign interests b add they have no way of telling ho much business was diverted to oth countries that might have be theirs. D. M. Pattison, vice pre dent-sales, Warner & Swasey C Cleveland builder of turret lath says his company has had some co respondence about cancellatio When the foreign companies fou out their orders were near compl tion and it would cost them a sizab sum to cancel, they went ahead wi their orders.

National Acme, another Clevela firm, reports its foreign business h not been cut. This is due in part the type of machinery it man factures. European firms do n make machinery comparable in si and rating so National Acme is in enviable position.

Bliss Gets Foreign Orders

E. W. Bliss Co., Detroit, has orde for rolling mills in Italy under t Marshall Plan totaling $1.3 millio The announcement is made by Ma shall M. Smith, vice president charge of foreign operations, who h returned from several months Europe. The equipment is for col rolling of steel sheets. Bliss al has an order, outside the Marsh Plan, for an aluminum mill Switzerland.

French Tool Team Coming

A French team of 18 machine t builders is coming to the Unit States in mid-November to stu American methods. They will vi machine tool plants in New Englar Cincinnati and Cleveland as part the President's Point Four progra to give underdeveloped areas t benefit of American know-how.

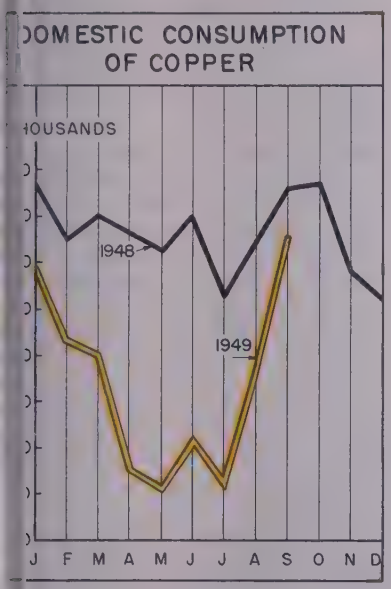
opper, Brass Demand Up

Surge pushes copper consumption to highest monthly level since a year ago

PLENISHMENT of inventories of pper and brass products and conued substantial demand for such ods shoved the domestic consumpn of copper in September to the hest level since a year ago.

Consumption is well sustained and tober figures are expected to at st equal those of September, but ustrial paralysis stemming from steel and coal strikes may soon rply cut the need for materials components of copper and brass.

Consumption Rises—Domestic conption of primary and secondary per in September totaled 114,760 tons, a sharp rise over the 88,088 s consumed in August, as the acpanying chart shows. This made



(Figures in thousands of tons)

September figure the highest since October, when consumption was 2700 tons. Low point since last ober was 61,200 tons in July.

he September surge is attributed demand from jobbers, consumers retailers for copper and brass ducts to replenish inventories that e allowed to shrink when a busie lull early in the year resulted xtreme caution in purchasing.

ookings Up—Business recovery in ust, completion of vacation shutons, abandonment of expectations further price reductions, a conued record-breaking production of omobiles, and a mid-year rise in e construction combined to push he demand for copper and brass ducts in September. New orders booked that month by makers of copper products and copper alloy goods required 106,089 tons of copper, an increase of 39,205 tons over the 66,884 tons needed for the business booked in August.

Largest Users—The three largest users of copper and brass are the automotive, housing, and electrical industries, the high rate of activity of the first two contributing substantially to business level of the electrical group.

Despite some apprehension as to what the steel and coal strikes will do to business, producers report continued pressure from consumers for November delivery of copper. Supply for both November and December is expected to be short. Sales for November shipment are said to already equal estimated mine production.

Devaluation Brings Lower Prices

SAVINGS up to one-half the original price on contact-type welding electrodes and other products marketed by North American Philips Co. Inc., New York, are made possible by foreign currency devaluations.

The company is able to import a number of products at reduced prices from Philips Industries in Europe and will streamline its domestic manufacturing.

Reductions in domestic operations will result in the closing of the firm's Dobbs Ferry, N. Y., plant when necessary arrangements have been completed.

Part of the equipment of the Dobbs Ferry plant is being moved to other Philips plants. Picture tubes for television sets and electric shavers are other items that will be available at lower prices.

Metallic Impurities Not Dutiable

UNDER a bill passed by the House just prior to adjournment, metallic impurities—mostly lead and zinc—in imported tin ore would not be dutiable. The bill still requires Senate action.

Government Wants To Do Business with You

IF YOU shy away from federal, state and municipal business because of the complexities involved, take heart. Government purchasing personnel are streamlining their methods to attract more private suppliers.

General Services Administration, formed this summer to supervise federal nonmilitary purchasing, may decentralize into regional offices to facilitate procurement and save on an annual $1 billion goods transportation bill. So states Jess Larson, administrator of GSA who spoke before the fourth annual conference and products exhibit of the National Institute of Governmental Purchasing. The group met in Cleveland Oct. 23-26.

Centralization Helps—A centralized agency for the first time is in charge of a federal procurement program which amounts to $8 billion annually for nonmilitary supplies and services. State and municipal purchasers likewise are centralizing and simplifying their organizations to interest independent contractors more.

They also seek to cut red tape to the minimum and better educate the private supplier to cope with the procedures still necessary to get public business.

Indicative of the success of such efforts is the case in New York city which last year got only one bid for an oil and gasoline contract. This year it got seven. In New York the commissioner of purchases spends more than $1 million a week. This doesn't include buying for new building construction or for the municipally owned subway system. About 30 per cent of this total goes for metalworking products like water pipe, plumbing equipment, automotive equipment and tools of all sorts. About 20 per cent is spent for food, 15 per cent for fuel. The New York commissioner spent $55 million in fiscal 1949 which ended last June 30, $45 million in fiscal 1948, $39 million in fiscal 1947, will spend $65 million in fiscal 1950. Government budgets for purchasing have gone up in about this proportion everywhere, but now promise to level off.

ECA To Aid Small Business

ECONOMIC Cooperation Administration is establishing an inquiry and export counseling group to aid small businessmen in their export problems under the Marshall Plan.

The new service can be contacted personally or by letter. Arrangements also have been made with the Commerce Department so its 42 field offices can aid small businessmen seeking information on ECA operations. These offices can furnish names and addresses of firms abroad importing specific products.

Gas Industry Booms

Expenditures for new facilities and equipment during five-year period would total $3.5 billion

RESURVEY of anticipated construction expenditures of the gas utility industry reveals that $3.5 billion will be spent on new facilities in the five-year period, 1948-1952.

Largest single class of expenditures will be devoted to natural gas transmission equipment which is expected to account for $1.8 billion, or 52 per cent of the total gas industry outlay. Other new natural gas construction—distribution, production and storage—will amount to $1.2 billion, making a total of $3 billion for the natural gas branch.

This picture of the industry was revealed at the annual convention of the American Gas Association in Chicago.

Assets Climb—Of this five-year total, approximately $770 million was spent in 1948 and $940 million is expected to be spent during the current year. Total gas plant amounted to $6.3 billion at end of 1948 and total assets attributable to the gas utility industry reached $7.5 billion on that date.

By all standards, the gas industry stands at an all-time high in its service to the nation, says Association President Robert W. Hendee, president, Colorado Interstate Gas Co., Colorado Springs, Colo. The gas utility industry serves approximately 23 million customers, with an additional 5 million customers getting benefits of gas from the liquefied petroleum gas industry. This represents an increase of more than one million utility gas customers during the past year. Today, natural gas alone supplies nearly 15 per cent of all energy in the country.

Spectacular Growth—Spectacular growth of the natural gas branch of the industry is attracting national attention. Last year, Federal Power Commission authorized construction of 8500 miles of new pipeline, bringing the total of natural gas pipelines in the United States to 251,330 miles. Applications are now pending for an additional 14,600 miles of natural gas lines.

President Hendee emphasizes that this is an era of rapid technological and economic change, and today more than ever before research bears the major responsibility for the industry's survival and progress. The association's research program now includes 40 active projects, these covering nearly every important phase of gas production, natural gas and domestic, industrial and commercial gas utilization.

Hugh H. Cuthrell, vice president, Brooklyn Union Gas Co., Brooklyn, N. Y., was elected president of the association.

Oil Well Drilling Benefiting

OIL field equipment producers are benefiting from the fast tempo of the petroleum industry's exploration and development program.

While oil consumption averages 2900 gallons a second, oil men drill wells at the rate of one every 13 minutes. They find new producers on the average of one every 23 minutes. Older wells are passing out of existence at the rate of one every 41 minutes.

Over the past 12 years, says American Petroleum Institute, the industry drilled 200,992 producing wells in this country. In the same period, 115,442 wells reached their economical production limits, and 118,008 wells ceased their natural flow and were placed on pumps. Every time 100 new oil wells are brought into production, 57 others are abandoned and 58 more become pumpers.

Astronomical Cost: Atom Power

ASTRONOMICAL costs of building and operating atomic power plants make any rapid or large scale inroads of nuclear power into industrial power production unlikely.

That is what the American ciety of Mechanical Engineers and American Institute of Mining & M allurgical Engineers were told at t 12th annual joint Fuels Confere at French Lick, Ind.

At most, said Ward F. David research engineer for Consolid Edison Co., New York, nuclear po plants might represent a supplem rather than a substitute for po from oil, gas, coal and water.

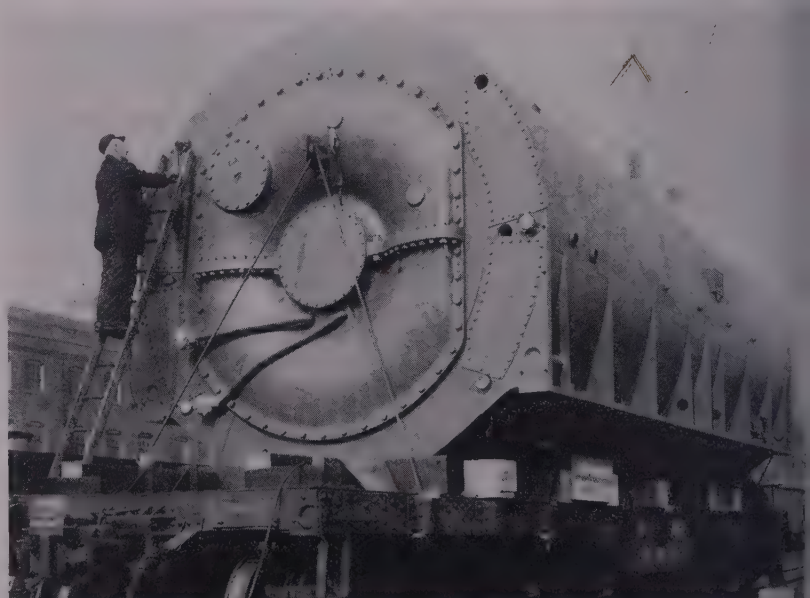
Spending $75 Million

ALTHOUGH it spent $43 million f 1945 through 1948, Pacific Gas Electric Co., San Francisco, is spe ing $75 million this year on exp sion of gas transmission facili

Largest individual project in year's program is the 1600-mile pipeline being laid from north California to Texas. The 34-inch project is called the "Super-In About 500 miles of the line are be laid by Pacific. Of these 30 m are in the ground; pipe on hand for another 20 miles. A long dra out steel strike will delay comple of the line, previously scheduled early 1951.

Another Utility Program Ending

Another utility company, Peop Natural Gas Co., Pittsburgh, has c pleted more than 80 per cent of three-year, $19.9 million program increase natural gas supplies and prove service to its more than 200 customers throughout western Pe sylvania.



HEAVYWEIGHT: This 375,500-pound stator for a 125,882 kva turbine generator in a large midwestern utility was one of the heaviest shipments in Allis-Chalmers' history. It had to be shipped on a special high-capacity freight car. Measuring 29½ x 13½ ft, the stator was completely sealed for shipment

ore U. S. Imports from Europe Vital

ECA warns that U. S. must import $2 billion more goods a year from Western Europe if that area is to survive economically. Agency hits American, foreign red tape

TED STATES must import $2 n more goods a year from West- Europe if that area is to survive omically. European government business leaders are giving un- d attention to the Economic Co- ation Administration study which ds this warning.

a report of an investigating mis- to Marshall Plan nations, ECA unces this country's "antiquated in some cases inequitable cus- procedures" and "prohibitive" f rates. The report demands cor- on of these impediments and re- al of oppressive controls imposed overnments of exporting nations. its the federal "Buy American " and local preference procure- t legislation of 22 states.

iticizes Europeans — The report cizes European producers and ex- ers for their failure to make e aggressive selling efforts in the . and European governments for iving exporters of the incentive ed for sustained effort by for- ing them free use of part of the rs thus earned. ECA points out the present $6 billion annual between American exports and rts cannot be financed much er by the American taxpayers gh ERP and World Bank loans. A believes that the problem can artly solved by "stimulating an nsion of exports from other tries to the U. S., accompanied n expansion of U. S. foreign in- ment." The $2 billion of increased al imports from abroad is sug- d only as a realizable figure. imports from ERP countries in totaled $1823 million, or 2 per of this country's gross national uct. In 1948 the value of im- from the same sources in- ed to $3167 million but this ped to only 1.2 per cent of the gross national product.

S. Tariff Battle Feared—Not ssed in detail in the report is general agreement on tariffs and negotiated at Annecy, France, summer. The U. S. in this pact ices to cut some of its tariffs uch as 50 per cent. Europeans a that this could be one more h to ignite a new tariff battle ongress next year. They wonder e U. S. government went too r they are acutely conscious of strong pro-tariff sentiment in rica.

IN RED SHANGHAI: Chinese workers are turning out railroad spikes for use in building more rail lines to bring more coal into Shanghai. Reds don't seem to mind that the automatic hammer comes from "decadent" Western nations and is a fruit of capitalism. NEA photo

Belgium Opens Chicago Show

Belgium has opened what may become a permanent trade exhibit in Chicago to attract American dollars. More than 200 Belgian manufacturers participate in the show.

All Benelux producers need the business, for the area is in the grips of a severe recession aggrandized by devaluation. Belgium devalued only slightly; now the country is being flooded with foreign goods, particularly from Britain.

The nation is as dependent upon exports as Britain. To bolster lagging sales, she is wooing Belgian Congo markets more assiduously and has cut the price of steel. Steel bars for Sweden now sell for $68 per metric ton, f.o.b. Antwerp. The former quotation was $90.

Frozen Funds Thaw in Ruhr

Ban on foreign investments in Western Germany has been partly lifted by a new order permitting liquid funds in Germany owned by foreigners to be unblocked and reinvested in German industry. This step is hailed as a prelude to the lifting of the embargo on new investment funds from abroad.

Steel exports are improving slightly. Only 42,000 tons of rolling mill products were exported all last year, but in the first half of 1949 nearly 194,000 tons were shipped abroad. About 30,000 tons monthly have been sent overseas thus far in the second half. Germany's total steel exports in 1936 amounted to 2 million tons.

Heaviest competition rages in the Near East, particularly between France and the Ruhr. German steelmen are complaining at French overexpansion in steel. They charge that the Sollac project in France to produce 300,000 tons of tin plate annually is unjustified, that the Ruhr traditionally has supplied tin plate for continental Europe.

U. K. Americanizes Sales

British metalworking companies are modifying their sales techniques to get more American markets. Automakers are boosting their advertising budgets to publicize the new low prices in the U. S. New sales offices in this ocuntry are being opened by large English firms. American export and import agents note increased inquiries from the United Kingdom regarding representation.

Producers of tubular products, automotive equipment, locomotives and power plant apparatus account for 40 per cent of all British export trade. Autos will be pushed the heaviest of all metalworking items in America. Total auto exports in the first half of this year totaled 100,112, of which the U. S. received 3084, compared with the 8285 received in the same period last year. British auto production promises to hit alltime highs in 1949 as the industry gets more and more steel; 196,709 cars were assembled in the first half, compared with 169,956 in the same period of 1948.

Russian Output Gains

The Soviets say their gross production this year is running 20 per cent ahead of last year, employment is up by 2 million and fulfillment of the current Five-Year Plan by the end of the fourth year, Jan. 1, 1950, seems assured.

In industry, the best individual records on the fulfillment of plan quotas were made by heavy machine building and the light metal industries, with 107 per cent. Coal production was 102 per cent of the quota, oil 105 per cent, agricultural machinery 98 per cent.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor,*

Agreement for settlement of government suit against steel industry's former pricing system drawn up by defendant steel companies in collaboration with FTC attorneys

LOOK for a softening in the Federal Trade Commission's attitude toward freight absorption. The philosophy that f.o.b. mill pricing is the only method for which a 100 per cent defense can be justified has gone in the discard. Recent testimony by commission spokesmen on the O'Mahoney freight absorption bill made it clear that a majority group in the commission recognizes the legality of freight absorption when it is done independently, in good faith, to meet competition, and not for the purpose of materially lessening competition.

Liberalized Policy Expected—More liberal policy toward pricing methods is expected to be revealed over the next few months in four decisions that are coming up. These decisions, it is learned on Capitol Hill, may have a powerful bearing on what the Senate will do on the O'Mahoney bill next year. If the commission shows by these decisions that it can administer the existing laws so as to permit needed pricing flexibility, Senate proponents of the freight absorption bill may conclude that remedial legislation should be abandoned or postponed.

Reflects Current Thinking — The way the wind is blowing is reflected in the deal now under discussion between commission and respondent attorneys in the case against the former multiple basing point, delivered-price system in steel. Under the proposed settlement, steel mills would have to quote f.o.b. mill prices and be willing to sell at those prices when so requested by the consumer; they could absorb freight "excepting when such freight absorption unlawfully lessens competition;" and each steel producer would fix his own extras without reference to the rest of the industry.

Must Have FTC Approval — The above represents the highspots of the proposed agreement for settling the steel pricing case. While steel companies have accepted such a settlement, it still will have to be approved by the commissioners. But the mere fact that the deal has progressed to this stage demonstrates a great liberalization in commission staff thinking.

Decisions are due also in the important lead and chain cases. The lead case, involving zone price fixing, was brought under the Clayton and Federal Trade Commission Acts. The chain case involves three kinds of pricing, a Pittsburgh plus type system, a basing point and freight equalization system, and a flat zone system; this case also was brought under both Clayton and Federal Trade Commission Acts.

Then there is the Corn Products Refining case, involving basing point price fixing. Reargument on respondents' motion to dismiss is slated for December.

Hope To Keep Authority — Being human, the commissioners, when considering these cases, will be keenly aware of the fact that the O honey bill, already passed by House, stands an excellent chan going through the Senate unless commission gives positive proo the meantime, that the remedy be obtained through more liberal realistic administration of the ton and Trade Commission Act they now stand. The commissio realize that the bill as it came the conferees, and as it passed House, would virtually strip the mission of authority over pr methods—and they wouldn't that.

Decisions in these four cases be important also in reflecting composite thinking of the reco tuted commission, which now cludes two new members, John son and a former senator from York, James Mead. Other mem are Lowell B. Mason, acting c man, and William A. Ayres. fifth member, Ewin L. Davis, Oct. 23.

No Check on Spending

RESIGNATION of Dr. Edwin Nourse as chairman of the Presid Council of Economic Advisers bec he was sick of the administrat spend-and-control policies will no effect in checking this progra

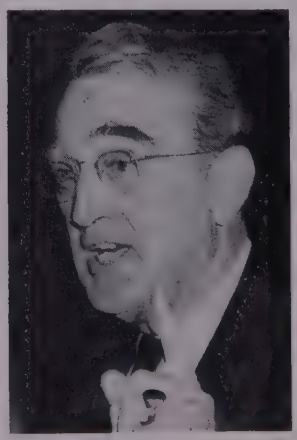
He will not be missed at the W House. Long ago he learned his views did not click with President. In recent months Keyserling has been given credi being chief economic adviser to President.

Dr. Nourse's resignation re the time, in 1934, when Lewis

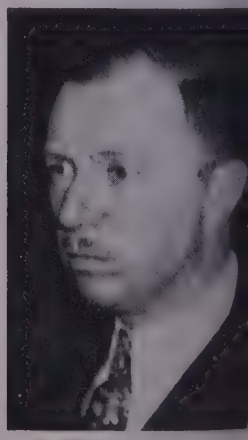
Members of the Federal Trade Commission

WILLIAM A. AYRES

JOHN CARSON



JAMES M. MEAD



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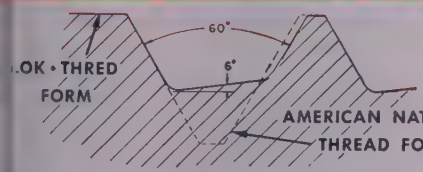

Note Lok-Thred's larger cross section . . . and flat root surface instead of a relatively sharp "V" . . . as compared to the American National Thread form. Here's the secret of Lok-Thred's greater strength.

National SCREWS AND THREADED PRODUCTS

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3423 So. Garfield Ave., Los Angeles 22, Cal.

Douglas, now ambassador to Great Britain, quit as Franklin D. Roosevelt's director of the budget. He made a nuisance of himself by objecting to the heavy deficit spending under Roosevelt. Net effect of his resignation was to remove an obstacle in the path of the spenders.

It's probably no exaggeration to say that if all the brass hats in the government let their consciences be their guide as Dr. Nourse did, the present administration would practically fall apart. Active newspapermen know that many government administrators privately are not in agreement with Truman policies. But when you work for the administration, you follow the White House line—if you want to hold your job.

Inter-American Affairs Bureau

INCREASING importance of relations with the other American republics has led to State Department organization of a Bureau of Inter-American Affairs. It is headed by Edward G. Miller Jr., assistant secretary for inter-American affairs, Willard F. Barber, deputy assistant secretary, William P. Hughes, executive director, Ivan B. White, economic and labor adviser, Norman M. Pearson, staff assistant.

Want a Government Post?

WOULD YOU take a top executive job with the government if it were offered to you? The salaries now are much more attractive than before; they range from $22,500 to $15,000 a year. The schedule:

Cabinet officers $22,500, up from $15,000; secretaries of armed services $18,000, up from $14,000; undersecretaries of departments $17,500, up from $10,330; assistant secretaries of departments $15,000, up from $10,000 to $12,000.

Positions of special interest to business: Chairman Munitions Board and chairman Research and Development Board $16,000, up from $14,000; chairman National Security Resources Board $17,500, up from $14,000; solicitor general and assistant to attorney general, $17,500, up from $10,330; federal mediation and conciliation director $16,000, up from $12,000; director of aeronautical research, National Advisory Committee for Aeronautics $15,000, up from $10,330; Federal Trade commissioners, Federal Power commissioners and Federal Communications commissioners $15,000, up from $10,000; Interstate Commerce commissioners $15,000, up from $12,000; National Labor Relations Board members $15,000, up from $12,000; undersecretaries of Army, Navy and Air Force $15,000, up from $10,330; RFC chairman $16,000, up from $15,000; RFC directors $15,000, up from $12,500; Maritime Commission chairman $16,000, up from $12,000, Maritime Commission members $15,000, up from $10,000.

To fill any of these jobs government personnel officers consider only the upper crust of businessmen or industrial executives receiving, or who have received, salaries of $25,000 or more.

Labor Rules Not Easy To Make

NEW REGULATIONS to carry out amendments to the Fair Labor Standards Act are under study by the Wage and Hour Administration.

Because of wording of the new legislation writing of rules will not be easy; they are slated for announcement when the new amendments take effect in January. One gives the administrator new, limited power to sue for back pay on behalf of workers possessing such claims. Another covers only workers "directly essential" to production, in contrast with former coverage of workers "necessary" to production; expectations are that court decisions will be required to establish the meaning of "directly essential."

Other changes in the new amendments tighten child labor restrictions, exempt more retail establishments such as laundries. They exempt forestry and logging workers; air transport and fish cannery workers are exempt from the overtime provision but not from the minimum wage floor.

Compliance with Safety Code

WIDESPREAD compliance with the new code for safe loading of steel on motor trucks and truck trailers is indicated by reports and inquiries received by the Interstate Commerce Commission's Bureau of Motor Carriers and by the American Trucking Associations Inc., Washington.

Both offices are furnishing copies of the code on request. It includes specifications for bulkheads to be built on the front ends of trailers so a steel load will not slide forward and kill the driver if there's an accident. The code calls for marking all motor carriers by Nov. 1 with the maximum safe steel loading capacity, and completion of bulkhead installations by Jan. 1.

Minerals Bill Held Up

CONTROVERSIAL O'Mahoney tional Minerals bill, passed by Senate, will come up in the H next year.

This is the measure which w authorize spending of $400 mi over five years to aid marg miners and to prevent idle co and other mines from being flo and their remaining deposits The bill, pressed by the intere mining companies, has administra acquiescence but no administra support. It would be a difficult to administer because it would the interior secretary in the posi of having to decide which mines qualified for assistance. Some ponents of the bill say it woul an entering wedge for governm control of the mining industry.

Fewer Weapons if War Com

IF ANOTHER war comes, indu will be asked to make fewer type weapons than in World War II.

This is indicated by a prelimi report to the army secretary by Army Equipment Policy Board hea by Lt. Gen. Raymond S. McLain. recommends: Reduction in num and types of individual weapons equipment; reduction in kinds of munition; fewer types and less var in caliber of guns; stabilizatio design of major items of equipm reconsideration of replacement tors; replacement of administra vehicles in posts and camps by c mercial-type vehicles; use of c mercial-type cargo vehicles in communications zones of theat elimination of non-essential it from tables of organization equipment; use of field tests to termine need and adequacy of it of questionable value.

The whole subject is to be revie further at a conference in Novem

Stockpiling To Be Stepped U

STOCKPILING of strategic and tical materials will be stepped this year.

The Munitions Board emerged f the appropriation mill with cash $315 million and contract autho of $420 million for fiscal 1950. compares with $225 million cash $300 million contract authority fiscal 1949. Attempts to put stri on the board fell through. It has freedom to place long-term tracts and to use its own discre in deciding what material should bough+ at home or abroad.

ggestions Pay Off

Delegates to National Association of Suggestion Systems meeting study successful plans

ST cutting with a bonus in better loyer-employee relations can be ned from a properly administered gestion system. Delegates to the ual meeting of the National Asso- ion of Suggestion Systems in eland Oct. 24 and 25 heard this upheld by representatives of panies who have used the plan essfully.

ey were told that in suggestion ems: 1. Details of the plan must outlined to employees and a de- e procedure pursued; 2. monetary pensation is an important factor successful plan; 3. other recogni- such as announcements on bul- boards and in house organs are lly important; 4. in event a sug- ion is not used the employee ld be told why it was rejected; 5. system should be tailor-made t the individual plant.

mpanies using suggestion sys- in 1949 paid out more than $2.3 ion for the 134,000 suggestions ted. The 12 top awards earned $68,000 for those who suggested t. Largest single award was made leveland Graphite Bronze Co. and the employee $12,104.

e investigators suggest the need further study by participating anies into the matter of maxi- and minimum awards. Both of awards should be arrived at tifically and not set arbitrarily.

Association officers to serve this year are: President, F. W. McMenimen, Public Service Electric & Gas Co., Newark, N. J.; vice presidents, S. W. Rubenstein, Philadelphia Electric Co., Philadelphia, and J. L. McVittie, Eastman Kodak Co., Rochester, N. Y.; secretary, A. W. Egner, Swift & Co., Chicago; and treasurer, G. H. Thobaden, Cleveland Graphite Bronze Co., Cleveland.

Human Frailty

CHIEF METALLURGIST Howard E. Boyer of American Esch Corp., Springfield, Mass., relates this story about customer relations:

Whenever a die cracked, a commercial heat treater he knows always had a good reason to tell his customers why it was not his fault. He always ended up paying the bill. But he has changed his tactics.

Now he goes to the customer, tells him he had an accident and asks what he should do about it. The customer often admits he has accidents too. Almost invariably the heat treater satisfies the customer by heat treating another die free.

IBM Expands Foreign Sales

ENLARGEMENT of International Business Machines Corp.'s market is announced by Thomas J. Watson, board chairman. Contract with British Tabulating Machine Co. that gave the British firm an exclusive license to IBM's accounting patents in the British empire with the exception of Canada has been canceled by mutual consent.

Growth of IBM's foreign business has resulted in formation of IBM World Trade Corp., a wholly owned but independently operated subsidiary, to handle all business outside the United States.

National Safety Awards

BETHLEHEM and Republic Steel corporations shared five of the nine awards to steel mills, traditional leaders in safety among heavy industries, in the metals section contest conducted annually by the National Safety Council.

Bethlehem swept the first three awards for largest steel mills in the year-long contest. The Johnstown, Pa., Lackawanna, N. Y., and Bethlehem, Pa., mills finished in one-two-three order. Republic's Canton, O., mill took first place in the next size group; Gulfsteel works of the company in Gadsden, Ala., finished third. National Tube Co. won second place.

Among smaller mills, first three awards went to: 1. American Steel & Wire Co.; 2. Copperweld Steel Co.; 3. Follansbee Steel Corp.

Gulf Research Lab Dedicated

GULF Research & Development Co., a subsidiary of Gulf Oil Corp., Pittsburgh, dedicated its oil prospecting research laboratory to Frank Adair Leovy, a pioneer advocate of scientific oil exploration.

The Leovy Laboratory of Geophysics is the largest of 40 buildings erected on a 57-acre research tract just outside Pittsburgh. S. A. Swensrud, president of Gulf Oil, dedicated the building. One feature of the completely air-conditioned building is a two-inch "lake" atop the building.

CALENDAR OF MEETINGS

Oct. 31—Nov. 1, American Machine Tool Distributors' Association: 25th anniversary meeting and banquet, Hotel Gibson, Cincinnati. Office of the secretary is at 505 Arch St., Philadelphia 6.

Oct. 31-Nov. 2, Packaging Machinery Manufacturers' Institute: 17th annual meeting, at Edgewater Beach Hotel, Chicago. Institute headquarters are at 342 Madison Ave., New York.

Oct. 31-Nov. 3, American Institute of Steel Construction: Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 101 Park Ave., New York.

Nov. 1-5, Pacific Chemical Exposition and Pacific Industrial Conferences: Running concurrently at San Francisco Civic Auditorium.

Nov. 2, American Iron & Steel Institute: Fifth regional technical meeting at the Waldorf-Astoria, New York.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington. Society headquarters are at 33 W. 39th St., New York.

Nov. 3, Society of Advancement of Management: Annual banquet, Hotel Statler, New York. Society headquarters are at 84 William St., New York.

Nov. 2-4, Industrial Management Society: 13th annual time and motion study clinic, Sheraton Hotel, Chicago. Society public relations headquarters are at 176 W. Adams St., Chicago.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington.

Nov. 2-4, American Society of Body Engineers: Fourth annual technical convention. Rackham Memorial Building, Detroit.

Nov. 2-4, Triple Mill Supply: Meeting of presidents, secretaries, convention and executive committees of American, Southern and National associations, at the Homestead, Hot Springs, Va. Headquarters of American Supply & Machinery Manufacturers' Association are at 1108 Clark Bldg., Pittsburgh.

Nov. 2-5, Mechanite Metal Institute: Annual meeting, Hotel Carter, Cleveland.

Nov. 3-4, Metals Casting Conference: Sponsored by Purdue University, Lafayette, Ind.

Nov. 7-8, Conference on X-ray and Electron Diffraction: Mellon Institute of Industrial Research, Pittsburgh.

Nov. 10, American Iron & Steel Institute: Sixth regional technical meeting, at the Mark Hopkins Hotel, San Francisco.

Nov. 10, Purchasing Agents Association of Chicago: Meeting, Hotel Sherman, Chicago. Association headquarters are at 134 N. LaSalle St., Chicago.

Nov. 10-11, American Management Association: Meeting on industrial cost reduction, at Palmer House, Chicago. Association headquarters are at 330 W. 42nd St., New York.

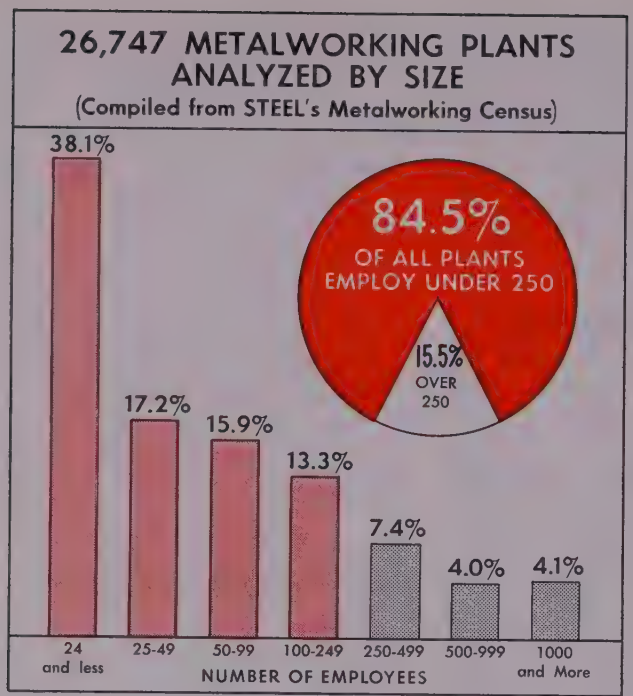
Nov. 10-11, National Foundry Association: 51st annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 120 S. LaSalle St., Chicago.

Nov. 10-11, National Symposium on Air Pollution: Sponsored by Stanford Research Institute in co-operation with California Institute of Technology, University of California and University of Southern Calif., Huntington Hotel, Pasadena, Calif.

Nov. 14-18, Refrigeration Equipment Manufacturers Association: Sixth refrigeration and air conditioning exposition, at Atlantic City Auditorium, Atlantic City, N. J. Association headquarters are at 1346 Connecticut Ave. N. W., Washington.

Nov. 16-18, Industrial Hygiene Foundation: 14th annual meeting, Mellon Institute, Pittsburgh.

Nov. 25-26, American Foundrymen's Society: New York regional conference, Syracuse University, Syracuse, N. Y. Society headquarters are at 222 W. Adams St., Chicago.



Small Companies Fac

Puzzling Pension Problem

Steel fact-finders' report accelerates uni welfare drive. May catch little manufact unprepared. Co-operative studies, joint pl may hold advantages for small employer

SMALL metalworking companies will have to face up to the pension problem much sooner than they believed a few months ago. Many small employers thought that it would be years before they would be confronted with decision as to what to do about union demands for retirement benefits. Some thought the problem never would filter down to the little fellow.

The steel fact-finding board's report and its prosecution by the unions have changed all that. As soon as the pension dispute is settled in the big companies, unions will press demands against small business.

Don't expect too much consideration because you are small. Nor will ability to pay be accepted as a criterion. Witness CIO President Philip Murray's statement at Youngstown Oct. 11: If a company can't afford pensions, it shouldn't be in business.

Big Problem for Little Manufacturer

In many respects the pension problem of the small employer is more serious than that of the larger companies. His costs in terms of cents per man-hour may be higher because he may not have enough employees to qualify under some of the more desirable, low-cost plans.

And there are a great many more of the smaller companies. Take a look at these figures from STEEL's census of the metalworking industries. Of a total of 26,747 plants, 4137 employ more than 250 persons, but 22,610 employ fewer than 250 persons. See accompanying chart for breakdown by employment groups.

Large companies retain independent actuaries and pension consultants to study their situation, analyze data on employees' ages, sex, race, earnings and past service, and to make recommendations on the type of plan best suited to the conditions of the employer.

Can the little fellow do the same? The cost per employee of such a study ordinarily will be greater for the small company. Much of the work the sultant does will be necessary no matter if the pany has 250,000 employees or 25. A company ploying 250,000 may pay a $25,000 fee to a pen consulting firm and the cost per employee is 10 cents. If the employer of 25 persons pays a $ fee, the cost per employee is $40.

Co-operative Action Suggested

This poses an obvious problem. One solution b considered by small companies is a co-operative st of the problem and possibly co-operative plans.

Pension consultants believe a group of small c panies in similar business and having fairly c parable labor forces can join in financing a joint st of their pension problem by a competent and i pendent pension consultant. This would make poss one study covering the total pension problem.

After the facts are analyzed and the various ty of plans suitable for the co-operating companies plored, each company is free to consider the de ability of establishing its individual plan. The operating companies might go further and estab a joint framework into which each company's i vidual plan could fit.

Two Advantages Possible

Two advantages would result: 1. The per ca cost of making the study and recommending a would be lower. 2. A joint pension framework c result in the adoption of a more desirable typ plan—one which would not be feasible for any on the small companies by reason of the limited nun of employees.

Sixty-two New York savings banks with an ave employment of 45 adopted such a co-operative in 1941 and established a self-administered plan w would not have been practicable for any one par pating member. Seven Vermont banks with a t

7 employees, or an average of about 14, set up o-operative plan in 1947. In the state of Wash-on, 15 banks with a total of 146 employees estab-ed a co-operative plan in 1948.

nder insured or under self-administered co-operat-plans, each company retains its identity and each s its own fair share of cost as determined by makeup of its employees—their ages, service, etc. aping permits a sharing of mortality experience. n benefits under a co-operative plan follow the e formula.

ppose a group of 15 small companies whose em-ment aggregates 600 persons, or an average of embarks on a co-operative study. First step ld be to retain a competent, independent con-ant to conduct a study of their problems. Fees such service may vary widely, but a fair figure a group of this size might be in the neighborhood 1500 to $4000, depending on the amount of work ired. Thus the cost per employee would fall in a range of $2.50 to $6.50.

nsultant Would Direct Study

ie consultant would ask for detailed data on loyees of each co-operating company, including h date, employment date, rate of pay, sex, and r. These would be analyzed for each company. fter these analyses are completed and a report smitted to members, a general meeting of the perating companies and the consultant would w. The consultant, on the basis of the analysis he employment data, financial history and out-of the companies and the size of the benefits desired, would outline the most advantageous plans.

Should the study indicate that advantages should accrue to the co-operating companies by pooling their plans within a common framework, yet each maintaining its identity, this project could be explored further by the companies and the consulting firm. Should the companies wish to establish separate plans, this could be done on the basis of the study, with the consultant indicating what type of plans would be best suited to the conditions revealed by the study.

What Types of Plans Are Available?

First major breakdown of types of pension plans is into insured or uninsured plans.

Insured plans usually use the facilities of a commercial insurance company. Types available:

1. Individual contract, in which the employer makes an annual contribution to a trustee who buys an insurance policy for each employee to provide a unit of retirement income at a specified age. About 60 per cent of pension plans now in effect are based on individual contracts; they cover only about 6 per cent of the total participants covered by private pension plans. The number of participants covered is usually small and averages about 50. Usually it is used to cover salaried and executive personnel rather than hourly-paid workers. Fringe benefits included make it rather expensive for covering wage earners.

2. Group permanent is somewhat similar to the individual policy but uses group practices. A minimum of 25 to 50 employees covered usually is required.

3. Group annuity plans involve a master contract between the company and insurance carrier providing for the purchase each year of a specified unit of ultimate pension to be provided for employees. Usually a minimum coverage of 50 employees is required and the national average coverage is 600. It cannot easily be used where a flat benefit payment is desired.

4. Deposit administration is a plan under which an insurance company agrees to handle the pension fund for the employer on a typical self-funded basis until retirement of employee. At retirement, the funds ordinarily are used to purchase single premium annuities. Usually this plan requires a minimum of 500 or 1000 employees. It may be adopted for use by the small companies under a co-operative plan.

False Move at Outset May Prove Costly

Uninsured plans are known as trusteed, self-funded, self-administered or self-insured. A trust is created and the employer periodically contributes what is needed to maintain the plan on an actuarily sound basis. Average coverage under these plans is about 2900. If used by small companies, co-operative action might be desirable.

Complexities of pension planning are myriad. The long-range cost of financing pension programs runs into tremendous figures. A false move in setting up a program may prove hazardous or even ruinous.

You should not only know and appreciate the impact of pension costs on your company, but also their relationship to those of your competitors.

Smaller companies must approach the pension problem with the same or greater care and responsibility as the larger companies.

COVERAGE OF PENSION PLANS
Compared by Periods They Became Effective

iod Plan ne Effective	Percentage of Employees Covered Per Company	Average Number Per Plan
PRIOR O 1930	77.7%	13,278 PARTICIPANTS
URING 30-1939	40.6%	1,026 PARTICIPANTS
URING 1940- t. 1, 1942	20.9%	534 PARTICIPANTS
URING t. 2, 1942-1944	20.0%	170 PARTICIPANTS
URING 45-1946	24.4%	169 PARTICIPANTS

repared by Willard A. Weiss, Eugene M. Klein and Associates

erage number of participants in pension plans decreased ly from the 1920s through 1946. After passage of the ial Security Act and particularly during the war, percen-of total employees covered by pension plans dropped as plans were restricted to salaried and executive person-Average employment in companies adopting pension before 1930 was 17,300. Average employment for com-s adopting plans in 1945 and 1946 was 690, indicating a increase in plans among the smaller companies.

The weight's in the load and not in the truck when fra
body panels, fenders, wheels and other truck structural p
are made of N-A-X HIGH-TENSILE. And while affording w
savings of up to 25% in section, the high physical prope
of N-A-X HIGH-TENSILE insure superior strength and incre
resistance to fatigue, corrosion, abrasion and denting.

This decrease in deadweight decreases on-the-job expe
too. Trucks built with N-A-X HIGH-TENSILE consume less
line . . . require less maintenance . . . give longer service.
the excellent formability, weldability, and fine surface te
of N-A-X HIGH-TENSILE mean that you build them better,
no added fabricating problems.

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Unit of National Steel Corpor

A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Record year in auto assemblies certain despite the steel strike. Output will fall sharply in November and December when many makers change models

DETROIT

R and truck assemblies were due cross the 1929 peak last Wednesday but the big push for this year is er and output will taper off sharply in November and December. del changes will be at a leisurely ce and while some plants have ficient steel to make a start on 50 designs they cannot continue re than a couple of weeks. Settlent of the steel strike will not help ich, since virtually every pound material in inventory is being sumed, and the consensus is that will take four to six weeks to ng stocks up to the proper balance steady production.

M in Best Shape for Steel

General Motors appears in somewhat better position on steel than rd and Chrysler, and its divisions e hoping to maintain production at st on a four-day work week. Some fting of steel supplies from one vision to another may be necessary keep operations going. Pontiac l run out its 1949 models this ek and reportedly has enough material for about three weeks of 1950 del assemblies. Chevrolet will clude the current series next week d then change over to the new sign. The plan apparently is to er regular and deluxe types, the ter to have a higher horsepower gine and a torque converter transssion as optional.

Buick will not change its special ies which currently accounts for er 50 per cent of total production, t there will be new body styles the Super and Roadmaster. The mer will use the same basic body ell as the present special, while Roadmaster will feature a comtely new body of the so-called "C Series," to be used by Cadillac as ll. There may be some delay in introduction of this body because the steel tieup.

Chrysler Lines Soon Down

Chrysler assembly lines probably l be stopped at the end of this ek to mark time until steel shipnts are resumed. It may be posle to continue Plymouth production a little longer, but Chrysler, dge and DeSoto will be forced to suspend. Tooling for body changes is fairly well along and the assembly shutdown could provide the opportunity to make equipment changes involved in setting up for the models.

K-F Closes After RFC Deal

Kaiser-Frazer last week terminated most of its production and assembly activity, laying off approximately 5000. No reason was given for the move, although it is likely related to the new financing which the company is arranging. The RFC has approved loans totaling $44.4 million, of which $10 million is to be made available to the Kaiser-Frazer Sales Corp. which in turn will make loans to dealers unable to arrange credit for new car shipments through conventional financing channels. The company had asked for $15 million for this purpose, but the sum was scaled down by one-third by the lending agency. Money drawn from the fund must be repaid in 18 months, with interest at 4 per cent. The RFC has placed a number of conditions on the other loan, of which $22.4 million will be used for engineering and tooling, and $12 million for working capital. Among them are a first lien or mortgage on the Willow Run plant and other property valued at $58 million and a $15 million guarantee secured by collateral worth $10 million.

The RFC last week released an unusually detailed statement covering the K-F loan, apparently in answer to critics who had charged the agency with favoritism to the Kaiser interests. The chairman of the RFC pointed out that Mr. Kaiser and his family and companies in which they are interested own less than 10 per cent of the corporation's stock. There are approximately 40,000 shareholders at the present time.

Ford Keeps Up Steel Output

Ford will keep production moving in its steel mill division, despite suspension of manufacturing and assembly on Nov. 11 and 15, respectively. Supplemental fuels are being used at the Rouge Plant to conserve steam and coking coal, and the cycle time of coke ovens has been doubled in order to stretch supplies to match available steel. Open-hearth furnaces were shut down Sept. 23 while a number of major repairs were being made in the blooming mill and hot strip mill. They resumed Oct. 14 and are now back in full production.

HOUSE ON WHEELS: Latest adaptation of the Ford F-3 forward control truck chassis is the Tour Wagon, veritable house on wheels. Developed by a leading commercial body builder, this innovation in motorized touring can be turned out on a production-line basis

turning out about 17,000 tons of ingots weekly. The Ford mill produces about 50 per cent of total steel tonnage requirements but cannot meet the balanced requirements necessary to continue manufacture of cars and trucks, due to the varying shapes and sizes involved. The company anticipates that it will be able to maintain the manufacture of service parts in sufficient volume to meet most demands.

Ford had planned to show 1950 models here around the 17th but doubtless will have to defer the unveiling until the steel picture clears. State fairgrounds was being considered as the site for the showing.

Ford sales manager J. R. Davis recently told an Atlantic City audience that careful study currently is being given to what extent factory schedules will have to be tapered off to meet the potential of the 1950 market for automobiles. He "guessed" the 1950 sales total might run as much as 10 per cent behind 1949, and added that the industry will be shooting at the 1949 record for as long or longer than it took to top the 1929 total.

Ford Markets House on Wheels

A NEW type of house on wheels, called a Tour Wagon and designed by a leading commercial body builder, is now available through Ford dealers. Ingeniously arranged to provide a three-room apartment-in-one, the vehicle is mounted on a forward-control parcel delivery chassis, in either 104 or 122-inch wheelbase. Interior height from floor to ceiling is 71 inches, width 6 feet 2 inches and length 15 feet. With the steering gear mounted ahead of the front axle, space ordinarily required for the hood and fender wells becomes available for passenger and storage room.

In the driving compartment are two special armchair seats equipped with built-in shock absorbers. A bedroom-dining room combination just aft of the driving compartment serves a triple purpose. On either side are 48-inch lounge seats and between them a 4-foot wide drop-leaf table. En route, passengers may lounge, nap or view the scenery from this point. At mealtime the table seats as many as seven and at night it drops down to bed height. Rubber seat cushions form a comfortable double bed, and bunk space is provided for two more.

Equipment includes a regular galley stove, a refrigerator capable of keeping 150 pounds of food and beverages chilled for two weeks, a kitchenette with a 14-gallon tank sink and work space, all in stainless steel. There are 20 cabinets and drawers conveniently placed yet out of the way. Wardrobe facilities accommodate ten suits of clothes, an 11-foot folding canvas boat, plus shoes and fishing tackle. Chemical toilet and lavatory are enclosed in a separate compartment across from the clothes closet. The doors of these rooms form a private dressing room, shut off completely from the front of the vehicle. A special shower bath tank which can be heated on the stove is mounted above the right front entrance, permitting a hot shower to be taken behind a snap-on curtain in complete privacy.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	678,092	478,186
September	647,000*	437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Oct. 8	148,443	119,398
Oct. 15	146,566	123,185
Oct. 22	145,132	123,067
Oct. 29	140,000	116,968

Estimates by Ward's Automotive Reports

English Auto Prices Cut

PRICE reductions of from $379 to $543 on English-built Ford cars and trucks have followed in the wake of devaluation of the pound. Retail delivered price at ports of entry on Anglia two-door sedan now is $947, on the Prefect four-door sedan $1039, on the ¼-ton Thames truck $813, and the ½-ton truck $1047. Approximately 12,000 British-built units have been shipped to the United States since May, 1948.

Dodge Roadster in Atomic Yellow

DODGE is now building its sports roadster in a new color, called atomic yellow no less. Also available are

speed crank window lifts and r
side windows of safety glass w
chrome-trimmed frames and vent
tor wing frames. The windows
raised or lowered with only 1½ tu
of the crank, and they come as ex
equipment, standard windows be
of clear plastic and not adjusta

Willys Export High

WILLYS-OVERLAND Export Co
has shipped the 100,000th vehicle to
sold overseas since postwar ope
tions began. Dollar value of these
port shipments tops $100 million a
in addition there have been sales
$9 million worth of parts and acc
sories, as well as $1 million wo
of farm implements and spec
equipment.

Agricultural implements manuf
tured by Monroe Auto Equipme
Monroe, Mich., are being exported
Willys and plans are being drawn
assembly and manufacturing pla
in India, France, Yugoslavia, B
gium, Sweden, Holland, Denmark a
Australia to produce a hydraulic
designed by the Monroe compa
as a Jeep accessory.

Not Worried by Strikes

THE steel and coal strikes are
causing West Coast car dealers
worry about supplies of automobi
Dealers' supplies of most models
comparatively large, and inventor
of some makes are becoming burd
some.

A majority of dealers are m
than eager to sell new cars and
elevating trade-in allowances v
above blue book value of the u
cars offered for trade. Other deal
are throwing in extras, or mak
cash discounts.

Several Seattle dealers are repor
shaving interest rates on time p
ments, offering cars on a basis
no money down, and extending ti
limits for payments. In other r
jor West Coast cities, San Franci
and Los Angeles in particular, the
no trend toward reduction in inter
rates, and time payments genera
are on a basis of one-third down w
about 30 months to pay the rest.

Unhampered by Strike

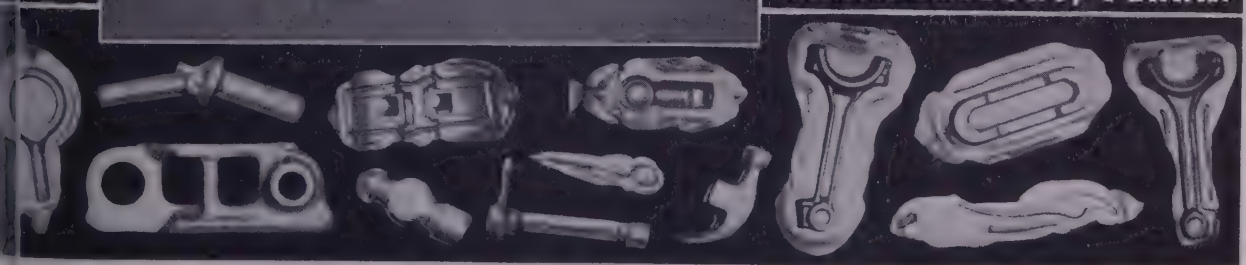
STUDEBAKER Corp. of Canada L
will be able to continue full p
duction at its Hamilton, Ont., pl
until sometime in mid-November,
C. Gaskin, vice president and g
eral manager, reports. If the st
strike in the United States is
settled by that time, the plant
be forced to shut down.

CECO-DROP

The Chambersburg CECO-DROP is a new piston-lift, gravity-drop hammer in which the ram is lifted by air or steam rather than by friction operated boards. There are fewer operating parts, shock-absorbing mechanisms are employed, lubrication is automatic and operation is simple and safe. In shop after shop, over the past few years, the CECO-DROP has amply proved that it can forge more minutes per hour, make more forgings with fewer blows, costs less to operate and is safer and easier on the hammerman.

Write for Bulletin 11-L-9

CHAMBERSBURG ENGINEERING CO.
CHAMBERSBURG, PENNA.



Jet Testing Laboratory

Completed by United Aircraft. Windowless structure is six stories high

UNITED AIRCRAFT Corp. saved a lot of money for its new experimental jet engine testing laboratory when wide-awake officials got hold of power generating equipment from Navy cruisers and war-surplus, lend-lease vessels.

Four boilers were on their way to a Philadelphia junk yard after the war when Pratt & Whitney Division of United found them. They were bought for a fraction of the cost of building new boilers. Six destroyer escort vessels yielded similar discounts on 12 turbogenerator sets for the laboratory.

The massive steel and concrete structure in East Hartford, Conn., is complete except for installation of a few major pieces of equipment. A windowless building, six stories high and 400 ft long, the laboratory will be named in honor of Andrew Willgoos, chief engineer of Pratt & Whitney for 23 years.

The central service equipment section of the laboratory has enough marine power to move a formidable fleet; the four generators turn out 18,400 kw—enough to supply a city of 70,000 with light and power.

Burns & Roe Inc., New York, was engineering consultant on the laboratory project; Albert Kahn Associated Architects & Engineers Inc., Detroit, the architect; and Turner Construction, New York, the contractor.

Idle Aircraft Plant Needs Facility

A huge aircraft plant at Stratford, Conn., left idle when the operators moved to Texas, will be sold jointly by United Aircraft Corp. and General Services Administration. The idea is to get it back into some phase of manufacture to make employment.

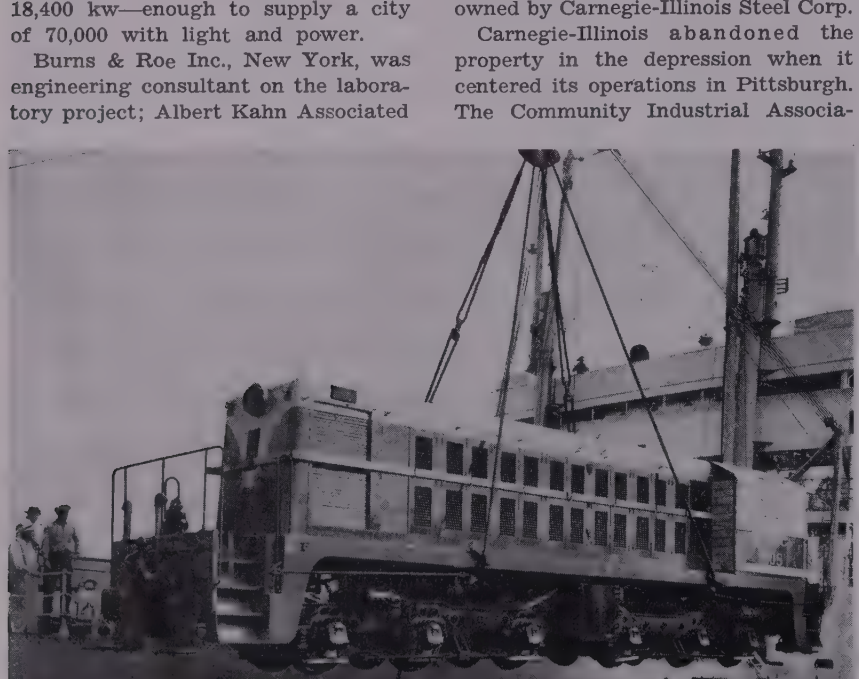
The plant's 43 buildings and 53 acres will be sold as a single unit. Bids will be received in the Office of Surplus Property, General Services Administration, 18th and F streets, Washington, up to Nov. 21 when they will be opened publicly.

Known as the Industrial Plant of the Chance Vought Aircraft Division of United Aircraft Corp., it was expanded by the Navy during the war to produce Corsair shipboard fighters. When the operator moved to Dallas in June, the Navy declared its interest in the property excess. Altogether the plant covers 1,450,000 sq ft.

Marion to Stay in Cambridge

MARION Power Shovel Co., Marion, O., is assured as a permanent industrial operation in Cambridge, O. The company exercised its option and purchased the sheet mill property once owned by Carnegie-Illinois Steel Corp.

Carnegie-Illinois abandoned the property in the depression when it centered its operations in Pittsburgh. The Community Industrial Association, Cambridge, a nonprofit or ization took over the property, w during the war was used by the ernment as a U. S. Engineers C subdepot. After the war the C munity Industrial Association a secured the property. Marion P Shovel leased the property with tion to buy. It employs 100 pe at the Cambridge plant where w ing draglines are manufactured.



PART OF A TRAINLOAD: Shipped from Whitcomb Locomotive Co.'s plant in Rochelle, Ill., this 66-ton diesel-electric locomotive is being loaded aboard the *S. S. Gadsden* in Baltimore for shipment to Fortaleza, Ceara, Brazil. It is only part of a solid trainload of parts and locomotives consigned to the Ministry of Transportation & Public Works in Rio de Janeiro

Essex Wire Wraps Up Cords

PURCHASE of all machinery, t inventory, buildings and real esta Cords Ltd., Newark, N. J., was r by Essex Wire Corp., Ft. Wayne, at a federal bankruptcy sale.

Essex Wire will continue to ope the business as Cords Ltd. Div of Essex Wire Corp. Many of same personnel will remain unde ownership. Production and deli will start about Nov. 1.

Colby Steel & Mfg. Started

ORGANIZATION of Colby Ste Mfg. Co. is announced by Mar Colby, president of Colby Ste Engineering Co., Seattle. Incorp tors of the new firm are officia the parent corporation. They M. S. Alexander, vice president; Senn Sr., supervising engineer; C les D. Gould, chief engineer; Fred Wubbena, assistant treas who will be treasurer of the organization.

Colby Steel & Engineering founded over 40 year ago, specia in cranes, marine elevators and terial handling equipment.

Pacific Car Expands

PACIFIC Car & Foundry Co. nounces a $300,000 expansion gram to diversify fabricating facil at its structural steel division. Jacobsen is manager.

Additional space will be affo by a steel building 85 x 420 f will involve 200 tons of structu Equipment will include auton welding devices, gantry crane, p riveting machine and plate shea and forming machinery.

Sargent Completes Building

E. H. SARGENT & Co. complete new Chicago offices and plant b ing in a new area of modern fact on the city's northwest side.

The one-story, steel, concrete brick building was designed to pand the services of the 97-yea company, a manufacturer and tributor of laboratory instrum apparatus and chemicals.

riefs . . .

Paragraphs on developments of interest and significance within the metalworking industry

nerman Products Inc., Cleveland, blished a western New York sales sion with headquarters in Roches- N. Y. Tinnerman is the manufac- r of Speed Nuts, Speed Clips and ed Clamps.

—o—

ield Valve Division of Minneapo- Honeywell Regulator Co. is add- to its field sales staff in a new expanded sales and manufactur- program that will cover the ntry. Efforts will be directed to ypes of manufacturing and proc- ng industries.

—o—

Iron Founders' Society has re- ed its 1949 "Directory of Mem- ." The 80-page book, largest in history of the organization, con- s an alphabetical list of 540 gray foundries in the U. S. and aii. Each firm's listing in- es name, address, telephone num- executive personnel, trademark, ral type of castings produced, and weight range of castings, ating capacity and type of found- operation. Society is located at National City Bldg., Cleveland.

—o—

sed Steel Car Co. is moving its ral offices from Pittsburgh to ago. Company has plants in Mc- Rocks, Pa., Chicago and Mt. on, Ill. The McKees Rocks and Vernon plants have been shut n for lack of orders and will re- closed until railroads come back the market for cars.

—o—

onal Pneumatic Co. closed its way, N. J., plant and moved to oston plant. Reason: Contraction e firm's business. It manufac- door control equipment for s, subways, trolley cars and s.

—o—

child Engine & Airplane Corp., ingdale, N. Y., will purchase land buildings now occupied by four ions of the company from Gen- Services Administration for $1,- 500.

—o—

Ilon-Abbott Corp., Plainfield, N. J., just completed three more new ings for the Texas Co. at its Point plant near Camden, N. J.

—o—

ler Industries Inc. is the new of Kaiser Engineers Inc., Oak- Calif. The engineering and construction division will continue to do business as Kaiser Engineers Division of Kaiser Industries Inc.

—o—

Fleet of America Inc. has started production of aluminum products in a plant in Blasdell, N. Y. The new company is headed by Tom Y. Smith, former general manager of Fleet Mfg. Co., Ft. Erie, Ont.

—o—

Vacuum Cleaner Manufacturers' Association reports factory sales of standard size household vacuum cleaners in September were third highest of any month in 1949. The total: 247,036 units, an increase of 12.3 per cent over 219,909 in August, and down 10.5 per cent from the September, 1948 figure.

—o—

Fischer & Porter Co., Hatboro, Pa., will hold its next instrumentation course at its Hatboro plant Jan. 23 through 27, 1950. Course will cover manufacture, calibration, installation, operation and maintenance of process control instruments.

—o—

New England Metallurgical Corp., Boston, acquired Springfield Heat Treating Corp., Springfield, Mass., which will be operated as a Springfield Division. A. Dudley Bach is president of the New England company, which also operates a Worcester Division.

—o—

Whiting Corp. consolidated its Whiting Freezer Division sales offices in Chicago with the company's general administration offices at Harvey, Ill.

—o—

Erie Railroad's annual report has been judged as best among central-eastern railroads for the second consecutive year in a survey conducted by *Financial World.* Presentation of a bronze "Oscar of Industry" will be made to Erie in New York, Oct. 31.

—o—

Youngstown Sheet & Tube Co.'s cold strip department at the company's Campbell, O., plant received a bronze plaque for operating over a million man-hours without a disabling injury. In this period the department produced 425,134 tons of steel, enough to make about 500,000 automobiles.

—o—

International Standard Electric Corp., subsidiary of International Telephone & Telegraph Corp., has a contract with the Republic of Lebanon to install a modern navigation and instrument landing system for the republic's new International Airport.

THE RIG IS UP: Five-deck, 60-foot empennage stand towers against tail of a B-36. Rig was made by Simpson Jumbo Steel Products Co., Azusa, Calif. NEA photo

—o—

Hydraulic Press Mfg. Co., Mt. Gilead, O., was given a contract for an 18,000-ton hydraulic press for forming heavy pipe for high pressure pipe line. H-P-M's customer is National Tube Co., Pittsburgh. Pipe up to 36 in. in diameter, 40 ft long with ½ in. wall thickness will be formed with the giant press. Here's how big the press is: Its die mounting surfaces are 4½ x 41 ft.

—o—

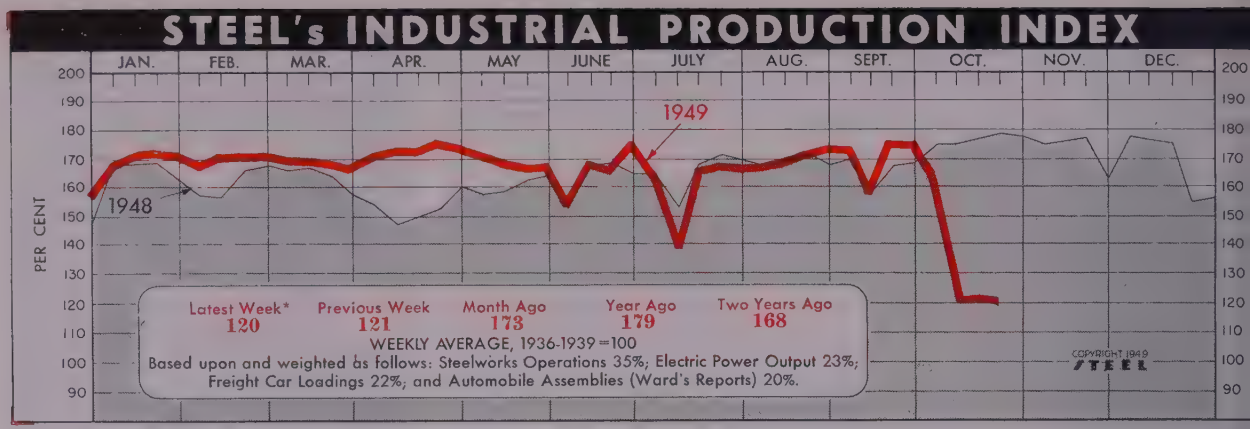
Russell Mfg. Co., Middletown, Conn., manufacturer of transmission belting, brake and clutch facing and asbestos specialties, will establish a branch manufacturing plant at Lexington, S. C., for production of nylon and cotton narrow elastic fabrics.

—o—

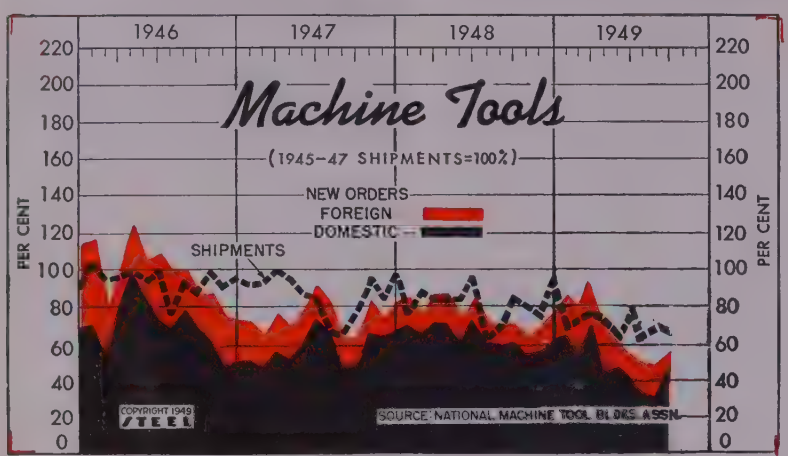
Whiton Machine Co., New London, Conn., appointed Valley Supply & Tool Co., Aurora, Ill., and Bansbach Machinery Co., Chicago, to handle Whiton's line of lathe chucks, centering machines, special purpose high production milling machines and gear cutters in the Chicago area.

—o—

Meehan Steel Products Co., Ironton, O., is building a new steel warehouse, 80 x 262 ft. It will provide storage space for products used in manufacturing finished steel products. Meehan also fabricates structural steel and ornamental iron.



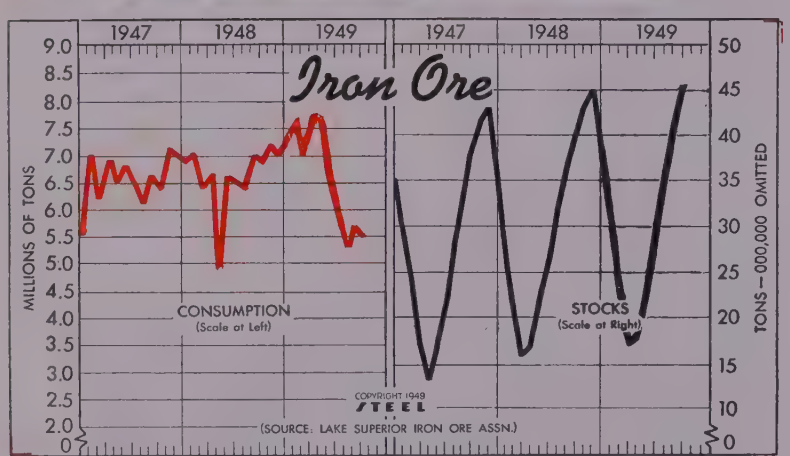
* Week ended Oct. 22 (preliminary).



Machine Tools

(1945-1947 Shipments = 100)

	Orders—Total		Orders—Domestic		Shipments	
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.6	83.4	38.0	71.5	79.0	94.4
July	48.0	74.0	34.0	61.1	60.7	62.4
Aug.	51.5	73.7	32.7	60.9	67.3	69.8
Sept.	57.7	73.1	44.0	61.5	67.6	84.7
Oct.	...	67.4	...	53.4	...	80.4
Nov.	...	72.2	...	54.1	...	76.2
Dec.	...	76.7	...	60.5	...	96.9

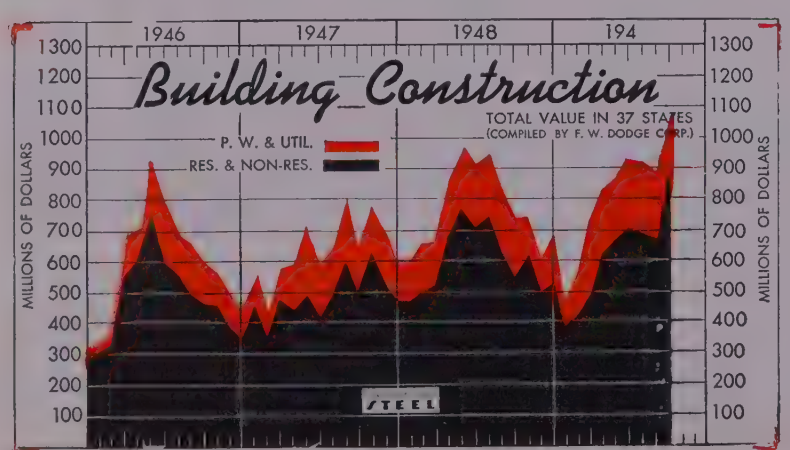


Iron Ore

(Lake Superior Iron Ore Assn.)

Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	7,277	6,656	21,508	22,058
June	6,249	6,577	27,696	26,963
July	5,258	6,479	35,064	32,611
Aug.	5,711	7,036	40,811	37,081
Sept.	5,541	6,965	45,356	40,923
Oct.	....	7,273	.....	43,383
Nov.	....	7,058	.....	45,160
Dec.	....	7,351	.....	39,460
Total	....	80,504		



Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works, Utilities		Residential and Non-residential	
	1949	1949	1948	1949	1948
Jan.	483.0	102.0	136.6	381.0	478.0
Feb.	568.5	153.5	177.3	415.0	504.6
Mar.	747.6	168.4	164.3	579.2	525.5
Apr.	842.6	222.4	184.7	620.2	689.2
May	880.3	213.5	205.0	666.9	765.8
June	945.7	239.0	215.7	706.7	719.5
July	943.6	252.7	217.9	690.9	744.8
Aug.	905.7	234.3	207.8	671.5	646.3
Sept.	1,093.7	223.1	202.7	870.6	559.3
Oct.	....	....	165.5	....	613.1
Nov.	....	....	106.9	....	504.3
Dec.	....	....	170.9	....	523.1
Total	....	....	2,155.3	....	7,274.4

The Business Trend

ALTHOUGH the physical position of STEEL's industrial production index for the week ended Oct. 22 changed only slightly, down 1 point to 120 per cent (preliminary) from 121 a week earlier, additional kinks were visible in the metalworking industry's armor. The pinch was beginning to hurt and additional companies began to get ready for cutbacks and shutdowns. Steel stocks are dwindling rapidly and even an early settlement of the strike will not eliminate shutdowns to balance inventories. Coal supplies are relatively better but are a source of growing concern.

In the corresponding week last year the index reached the high point for 1948. A glance at the accompanying chart shows a difference of 59 points between the latest week and the same week in 1948.

AUTOMOBILES—The nation's healthiest industry joins the list of those with aches and pains. Output remained high in the week ended Oct. 22 with 156,132 passenger cars and trucks rolling off assembly lines. It was, however, the fifth consecutive week in which production was lower than in the preceding week. November output is certain to be affected no matter what happens to steel. Cutbacks are expected in order to spread employment but in some cases shutdowns are perilously close at hand. Introduction of new models scheduled for November by several builders is now clouded by uncertainty.

COAL—Bituminous coal output in the week ended Oct. 15 was about 2.4 million tons, compared with 2.2 million tons in the preceding week and 12.5 million tons in the same week last year. Mines employing United Mine Workers were shut down with the exception of those west of the Mississippi. Shrinking coal stocks have forced some railroads to curtail operations of steam drawn passenger trains.

RAILROADS—Association of American Railroads estimates railroad operating revenues in September decreased 16.6 per cent as compared with the same month a year ago. Freight revenue was down 17 per cent and passenger revenue dropped 15.8 per cent. Decreases were recorded in each of the three districts in which the nation's railroads are divided.

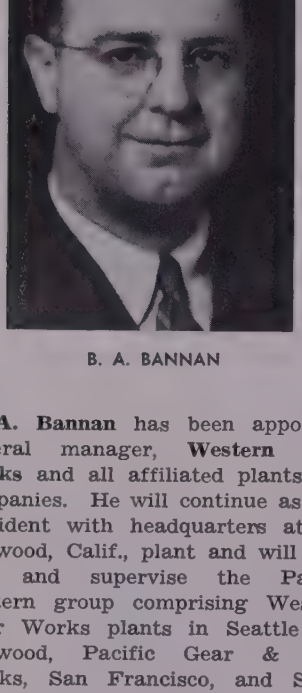
CONSTRUCTION—Civil engineering construction volume totaled $121.5 million in the week ended Oct. 20, down 6 per cent below the corresponding week last year. Heavy construction for the year to date totals $6.6 billion, 17 per cent above the corresponding total a year ago. Private construction is $3.1 billion and public construction $3.5 billion, 15 per cent and 19 per cent, respectively, above year ago totals.

PRICES—Bureau of Labor Statistics wholesale price index remained unchanged in the week ended Oct. 18 at 152.1 per cent of the 1926 average, 8.3 per cent below the comparable week in 1948. The metals and metal products index also was unchanged at 169.2. The bureau's comprehensive monthly wholesale price index rose 0.5 per cent in September to 153.7 per cent of the 1926 average but was 9 per cent below the year ago level.

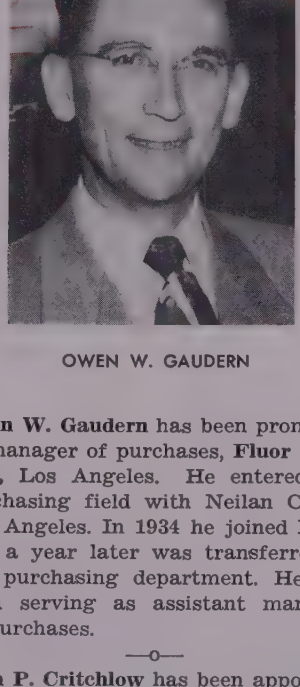
BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	9.5	8.0	86.0	98.5
	Electric Power Distributed (million kilowatt hours)	5,418	5,481	5,556	5,539
	Bituminous Coal Production (daily av.—1000 tons)	398	385	1.400	2.077
	Petroleum Production (daily av.—1000 bbl)	5,072	5,044	4,933	5,644
	Construction Volume (ENR—Unit $1,000,000)	$121.5	$143.7	$188.7	$129.0
	Automobile and Truck Output (Ward's—number units)	145,132	146,566	158,007	123,067
	* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	575†	584	661	928
	Business Failures (Dun & Bradstreet, number)	181	172	169	124
	Money in Circulation (in millions of dollars)‡	$27,427	$27,546	$27,365	$28,157
	Department Store Sales (changes from like wk. a yr. ago)‡	−12%	−11%	− 7%	+11%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,216	$10,477	$15,160	$15,842
	Federal Gross Debt (billions)	$256.6	$256.5	$256.4	$252.3
	Bond Volume, NYSE (millions)	$15.9	$14.1	$14.2	$19.8
	Stocks Sales, NYSE (thousands of shares)	6.628	6,225	6,366	6,933
	Loans and Investments (billions)†	$66.2	$66.1	$66.3	$62.1
	United States Gov't. Obligations Held (millions)†	$37,300	$37,252	$37,594	$33,022
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	169.1	170.6	180.3	221.7
	All Commodities†	152.1	152.1	154.0	165.8
	Metals and Metal Products†	169.2	169.2	170.5	172.6
	† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. ††1935-1939=100.				

Men of Industry



B. A. BANNAN



OWEN W. GAUDERN

THOMAS K. CONNELLAN

B. A. Bannan has been appointed general manager, **Western Gear Works** and all affiliated plants and companies. He will continue as vice president with headquarters at the Lynwood, Calif., plant and will control and supervise the Pacific western group comprising Western Gear Works plants in Seattle and Lynwood, Pacific Gear & Tool Works, San Francisco, and South Western Gear Works, Houston. **B. J. Bannan,** Seattle, has been appointed assistant to the new manager, and will also have headquarters in Lynwood. His major responsibility will be co-ordination of manufacturing operations.

—o—

Robert Montgomery has been appointed general parts manager, **Willys-Overland Motors Inc.,** Toledo, O. **August Benhoff,** who has been with the company for the last 45 years, and has been head of its parts department for the last 36 years, will remain in active duty with the company to assist Mr. Montgomery in an advisory capacity. Since June of this year, Mr. Montgomery has been assistant to **Delmar G. Roos,** first vice president and operating head of Willys-Overland, and prior to June was comptroller of the company for two years. He is succeeded as assistant to Mr. Roos by **C. Coyle Smith,** manager of the projects planning and research department, who joined Willys' administrative planning staff in 1946.

—o—

Joseph N. Moorhead, who retired in July as works manager, Buffalo plant, American Magnesium Corp., has joined **Electro Refractories & Alloys Corp.,** Buffalo, in a consulting capacity.

Owen W. Gaudern has been promoted to manager of purchases, **Fluor Corp. Ltd.,** Los Angeles. He entered the purchasing field with Neilan Co. of Los Angeles. In 1934 he joined Fluor and a year later was transferred to the purchasing department. He has been serving as assistant manager of purchases.

—o—

John P. Critchlow has been appointed chief fuels and lubricants engineer, rolling mill section, for **Gulf Oil Corp.,** subsidiary, Gulf Refining Co., Pittsburgh. He joined Gulf in 1947 as lubrication engineer, and previously was with Mesta Machine Co. as rolling mill design engineer.

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Howard Kyser, formerly plant production superintendent, Vernon, Calif., plant of **Studebaker Pacific Corp.,** has been appointed general superintendent. He was first employed by Studebaker in 1926 as a laboratory engineer at its main plant in South Bend, Ind.

—o—

Kenneth A. Field has been appointed service manager, Wellsville, N. Y., Works, **Worthington Pump & Machinery Corp.** He was previously employed by Allis-Chalmers Mfg. Co.

—o—

J. W. Coffman has been elected president and treasurer of the newly organized **Tecnifax Corp.,** Holyoke, Mass., manufacturer of diazotype materials and supplies for use on Ozalid and similar whiteprinting machines. Mr. Coffman formerly was vice president of General Analine & Film Corp. in charge of its Ozalid Division. **S. C. Slifkin,** formerly research director of Ozalid, is vice president and director of research of the new firm.

Thomas K. Connellan has been pointed manager, Strand Garage D Division, **Detroit Steel Products** Detroit. He has been with Str garage door since its inception October, 1945. He was assistant **Carl A. Strand,** president, Str Building Products Co., for seve years up to December, 1947, w that firm was bought by Det Steel Products Co. Since then Connellan has been in charge of s and promotional work for the Str Garage Door Division.

—o—

Alex Zuk has joined **Laclede-Chri Co.,** St. Louis, as engineer in Arch & Wall Sales Division, w headquarters in New York. He been with Westinghouse Elec Corp. for 10 years, and for two ye was with Iorio Construction Newark, N. J.

—o—

Earl T. Gruendike, formerly gene superintendent, **General Railway S nal Co.,** Rochester, N. Y., has been pointed works manager, and **Cha J. Gendreau,** formerly assistant f tory superintendent, becomes gene superintendent. Mr. Gruendike joi the company in 1922.

—o—

Raymond Z. Oswald has been elec vice president, **Cleveland Graph Bronze Co.,** Cleveland, in charge replacement sales. He was presid of Monmouth Products Co. when was purchased last month by Cle land Graphite Bronze. Mr. Osw has been in the automobile pa sales field for 24 years. From 1 to 1945 he was with Thompson Pr ucts Inc., Cleveland, becoming bu ness manager of its service divisi In 1945 he became director of ope tions at Harry Ferguson Inc., in

TINNERMAN

Speed Nut

SAVINGS STORIES

Studebaker

USES "J" TYPE SPEED NUTS

Saves 35% on Fender Assembly Cost

Right out of Studebaker's own cost estimate files comes this report of outstanding SPEED NUT savings.

To establish this saving factor, tests were made using 18 welding nuts to fasten the rear fenders to the body. Then, for comparison, 18 "J" Type SPEED NUTS were used to perform the same operation. The resulting statistics reveal that SPEED NUTS *provide a 35% savings in material and assembly costs on this application.*

This is one reason why there are hundreds of SPEED NUT brand fasteners of various types used in the assembly of the 1950 Studebaker.

Here, too, is sufficient reason why you should investigate the SPEED NUT way to lower assembly costs and improved product quality. Ask your Tinnerman "Fastening Specialist" for information on the comprehensive Fastening Analysis Service . . . and write for your free copy of SPEED NUT Savings Stories. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners, Ltd., Hamilton.

troit, and resigned the following year to join Monmouth.

—o—

Gustie Stevenson has been appointed

GUSTIE STEVENSON

chief engineer, **Arthur Colton Co.,** Detroit, builder of pharmaceutical and packaging machinery, and division of Snyder Tool & Engineering Co. He joined F. J. Stokes Machine Co., Philadelphia, in 1925 as chief draftsman, and became chief engineer of that company, serving from 1942 until 1949. **Al Kath,** veteran of the Colton organization, with 40 years of experience in the building and development of pharmaceutical and packaging machinery, has been appointed chief engineer, and **Kenneth E. Rogers,** who joined Snyder Tool & Engineering Co. in 1947, transfers to the Colton division as assistant director of sales.

—o—

Spencer K. Butterworth has joined the metal department of **Bache & Co.,** New York. He has been actively engaged in the metal business for the last 30 years, and prior to World War II was the sole proprietor of S. K. Butterworth Co., specializing in nonferrous metals. During the war he was deputy director, Tin, Lead & Zinc Division, War Production Board, and subsequently, held the same position in the Civilian Production Administration.

—o—

Bay State Abrasive Products Co., Westboro, Mass., announces appointment of **Elden L. Auker** as assistant district manager in the Michigan area. Since January, 1948, he has been employed by Bay State as an abrasive engineer and prior to that time was Detroit district manager for Mid-West Abrasive Co.

—o—

Henry L. Charlton has been elected president of **Highway Trailer Co.,** Edgerton, Wis., to succeed **E. A. Menhall.** Mr. Charlton was a vice president and director of Reynolds Metals Co. and was associated with Reynolds' interests for 25 years before retiring recently. Highway Trailer, which makes commercial trailers and equipment for power companies and telephone and oil industries, is controlled by Liberty Products Corp. and Atlas Corp.

—o—

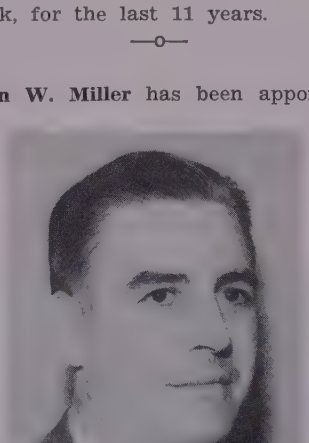
Henry B. Thackston, manager, Atlanta district, replacement tire sales division, **B. F. Goodrich Co.,** Akron, has been appointed sales development manager of the southeastern division, with headquarters in Atlanta. He is succeeded by **Donald E. Lagarde.**

—o—

S. A. Press has been appointed general sales manager, **Swan-Finch Oil Corp.,** New York. He has been sales manager, John Lucas Paint Co., New York, for the last 11 years.

—o—

John W. Miller has been appointed



JOHN W. MILLER

superintendent of production planning at the Fontana, Calif., plant of **Kaiser Steel Corp.** He succeeds **Thomas Jones,** resigned. Mr. Miller went to Fontana in 1945 as assistant superintendent of production planning. He had previously been associated with Carnegie-Illinois Steel Corp., South Chicago, Ill.

—o—

Gordon R. Findlay has joined **National Research Corp.,** Cambridge, Mass., to engage in research in the field of applied physics.

—o—

National Lead Co., Baroid Sales Division, New York, announced promotion of four employees in its production department and mining and milling operations: **Reginald Rowand,** superintendent of Baroid's bentonite plants and properties, with headquarters at Belle Fourche, S. Dak., has been appointed manager, Baroid's Magnet Cove, Ark., barytes plant and pr erties. **Harold E. Billings,** since 1 cost analyst, production departm has been made supervisor of prod control, Baroid's production dep ment. **B. C. Elsley,** staff engi with Baroid, has been appoi assistant superintendent, bento plants and properties. **Byron H. Cain,** supervisor of excavation Baroid, has been made superint dent, bentonite mines and mills.

—o—

Belfield Valve Division, **Minneapo Honeywell Regulator Co.,** Min apolis, has added to its field s staff in a new and expanded s and manufacturing program. Th assigned on regional valve sales **Russell A. Schlegel,** eastern reg with headquarters in New Yo **George Brown,** central region, w headquarters in Cleveland; **Rob Scott,** midwest and northwest regi with headquarters in Chicago; **William Clements,** Pacific-north co and mountain regions, with headqu ters in Los Angeles. These men w formerly members of the field s staff of Honeywell's Brown Inst ments Division.

—o—

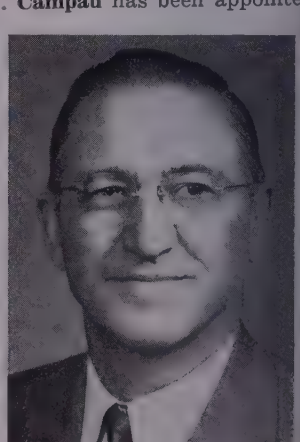
C. M. Robertson has been appoin an associate of **Gute Co.,** manuf turers' representative of mach tools, with offices in the Wiscon Tower Bldg., Milwaukee. Mr. Robe son is a mechanical engineer.

—o—

Roger S. Warner has resigned director of engineering for the At ic Energy Commission, and has joi the staff of **Arthur D. Little I** Cambridge, Mass.

—o—

A. J. Campau has been appointed



A. J. CAMPAU

rector of the purchasing and s vage section of **General Motors Co** Detroit. He succeeds **D. F. H grave,** recently named executive

Sharon Stainless Looks Better...

Here

and here

er Products, Higher Production
ter Costs With Sharon Stainless

o those of you who are not already using on Stainless Steel we offer a challenge. Give our steel requirements and we will furnish with Stainless that will fit the job to perfec- And the steel will come to you of uniform ter, gauge and size, eliminating unnecessary page, adding extra hours to the life of your and reducing buffing and finishing time.

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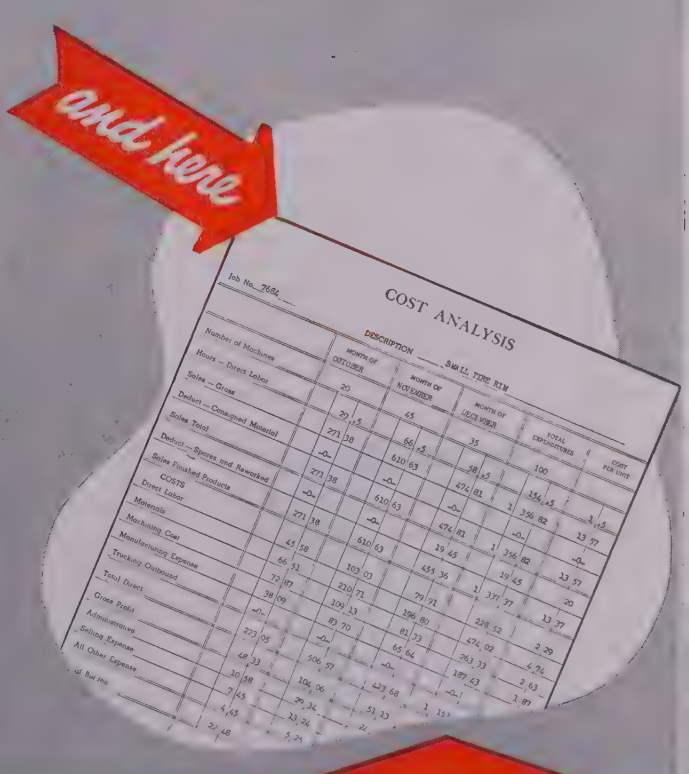


SHARONSTEEL

SHARON STEEL CORPORATION *Sharon, Pennsylvania*

F SHARON STEEL CORPORATION AND SUBSIDIARIES: THE NILES ROLLING MILL COMPANY, NILES, OHIO; DETROIT TUBE AND STEEL DIVISION, DETROIT RAINARD STEEL COMPANY, WARREN, OHIO; SHARONSTEEL PRODUCTS COMPANY, DETROIT, MICHIGAN, AND FARRELL, PENNA.; CARPENTERTOWN COA , MT. PLEASANT, PENNA.; FAIRMONT COKE WORKS, FAIRMONT, W. VA.; MORGANTOWN COKE WORKS, MORGANTOWN, W. VA.; JOANNE COA , ACHEL, W. VA. Hot and Cold Rolled Stainless Strip Steel—Alloy Strip Steel—High Carbon Strip Steel—Galvanite Special Coated Products—Cooperage Hoop— Sheets—Hot Rolled Annealed and Deoxidized Sheets—Galvanized Sheets—Enameling Grade Steel—Welded Tubing—Galvanized and Fabricated Steel Strip— Steel Strapping, Tools and Accessories.

ALES OFFICES: Chicago, Ill., Cincinnati, O., Cleveland, O., Dayton, O., Detroit, Mich., Indianapolis, Ind., Milwaukee, Wis., New York, N. Y., Philadelphia, Penna. Rochester, N. Y., Los Angeles, Calif., San Francisco, Calif., St. Louis, Mo., Montreal, Que., Toronto, Ont.

charge of the procurement and schedules activities of the GM manufacturing staff. Mr. Campau has been with General Motors since 1916, when the company acquired Scripps-Booth Motor Co., with which he was associated. Since 1939 he has been assistant director, purchasing and salvage section.

—o—

T. A. White has been appointed to head a new Pacific Coast sales region based in San Francisco for **Pontiac Motor Division,** General Motors Corp. He has been San Francisco zone manager for the division, and is succeeded by **Don R. Stuart,** who has been Omaha zone manager. **J. C. Jamieson** heads the new western sales region based in Kansas City, Mo., for Pontiac. He has been connected with the division since 1934, served in the Denver and Chicago zones before transfer to the Dallas zone in 1940 as assistant zone manager, and was named to head the Dallas zone in 1945. The latter post will be filled by **I. J. Woodfin,** assistant manager of the Atlanta zone.

—o—

Robert E. Harrington has been elected vice president and sales manager, **Western Machine Co.,** Milwaukee. He has been with the firm 23 years.

—o—

E. J. de Ridder, European engineer, has joined the staff of technical service engineers of **Reynolds Metals Co.,** Louisville, and has been assigned to aluminum design work. He has done design work with various aircraft companies and was chief engineer with I. G. Farben, Lightmetal Division.

—o—

Harry L. Spencer has been named

HARRY L. SPENCER

vice president in charge of manufacturing and engineering for the five plants of Norge Division, **Borg-Warner Corp.,** Detroit. He rejoined Norge in 1948 after five years with Bendix Home Appliances Inc., where he was vice president in charge of manufacturing. At the time he left Norge in 1943, he was factory manager of the Muskegon Heights, Mich., appliance plant.

—o—

James H. Cassell Jr. has been named director of public relations, **Pressed Steel Car Co. Inc.,** with headquarters in New York. Until recently he was a member of the staff of *Wall Street Journal* in New York and in Pittsburgh. **Maj. Gen. John Hilldring** (U. S. Army, ret.) has been elected a director of the company.

—o—

Richard G. Johnson has been appointed sales manager of **Van Auken Inc.,** with headquarters in Detroit. He has been with Cello Products Co., East Boston, Mass., where he was sales manager, and was previously associated with Snow Sales Co., Spokane, Wash., and Plymouth Motor Corp., Detroit. Van Auken Inc., with plants at Detroit and Mt. Clemens, Mich., was recently purchased by Penn-Ohio Steel Corp., Birdsboro, Pa., and is being operated as a subsidiary of that company. It manufactures the Van Auken line of automobile grille and deck guards.

—o—

Henry T. Sulcer has been appointed general manager of **Graver Water Conditioning Co.,** New York, subsidiary, Graver Tank & Mfg. Co. Inc. Mr. Sulcer had been general auditor of the parent company, which he joined in 1948. **Edward W. Welp,** formerly sales manager, Graver Water Treating Division, will assist Mr. Sulcer, and will make his headquarters in Chicago. **S. D. Barr,** previously in charge of eastern district sales, has been promoted to general sales manager, with offices in New York. The technical division of the company is now headed by **Vincent J. Calise.**

—o—

Oscar M. Havekotte has resigned as president of **International Derrick & Equipment Co.,** Dallas, and as a director of **Dresser Industries Inc.,** Cleveland. Mr. Havekotte was assistant treasurer of Carnegie-Illinois Steel Corp. when, in 1940, he was elected president, International-Stacey Corp., now International Derrick & Equipment Co.

—o—

F. E. Satterthwaite has been appointed quality control engineer, Plastics Division, chemical department, for General Electric Co. at Pittsfield, Mass. He has been quality control engineer for the product service division of the company in Bridgeport, Conn. He joined Gene Electric in 1946 as quality cont engineer in the fractional horsepow motor engineering division at Wayne, Ind., and in 1948 went Bridgeport to engage in simi work in the product service divisi

—o—

Charles L. Waggoner has resigned general superintendent, **Geneva St Co.** plant, Provo, Utah, subsidia U. S. Steel Corp. **James V. Mazu** was appointed superintendent of ro ing mills at Geneva, succeeding **D. Peterson,** who was named ass tant to the general superintendent

—o—

Howard B. Gunderson, preside Salt Lake Area Vocational Scho has been appointed supervisor training for the Utah Copper Di sion of **Kennecott Copper Corp.** Salt Lake City, Utah.

—o—

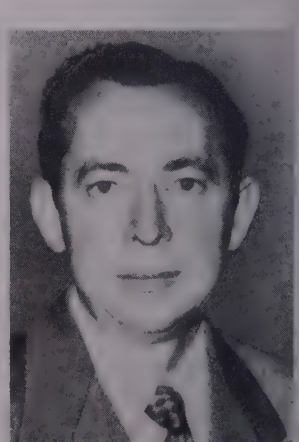
E. A. Jacquemart has been nam western divisional sales manager **Kaiser-Frazer Corp.,** Willow Ru Mich.

—o—

Max L. Murdock, acting manag centrifugal pump department, **All Chalmers Mfg. Co.,** Norwood, Works, has been promoted to ma ager of the department. He succee **H. C. Gaton,** retired. **Woodr Brixius,** formerly applications en neer in the company's West Al Works centrifugal pump departme has been named assistant to Mr. Mu dock, and **Paul B. Hugenberg** h been appointed application engine in charge of sales and orders.

—o—

Howard W. King has been appoint



HOWARD W. KING

West Coast district manager, **Di mond Chain Co. Inc.,** Indianapol He will have headquarters in S Francisco. Mr. King has been asso ated for 21 years with Diamo

ain, the last 14 years as district es representative in Chicago.

—o—

nard E. Meyer has been named

BERNARD E. MEYER

succeed **Frank Willmott** as Chio district sales manager, **E. W. Bliss Co.** Mr. Meyer joined Bliss in 35. A sales engineer covering the cago area since 1928, he has been special assignment for the last r months in the general sales orization at the company's execui offices in Toledo, O. Mr. Willt joined the Toledo Machine & l Division of Bliss in 1923 as sales ineer.

—o—

ert B. Marsand has been elected utive vice president and general nager of two affiliate companies of Eastern Metals Corp.: **Structural Iron & Steel Corp.** and **Industrial Materials Export Corp.**, both of Newark. Mr. Marsand, who is president of the American-Brazilian Trade Council, has been in the steel business, both domestic and export, for the last 14 years.

—o—

Fred H. Haggerson, president, **Union Carbide & Carbon Corp.,** New York, was given the 1949 medal award for the advancement of research by the American Society for Metals. He was cited as an outstanding example of an industrial leader who has advanced technological progress in broad fields of the metal industries to the ultimate benefit of the consuming public.

—o—

Verne H. Schnee, formerly assistant director, Battelle Memorial Institute, has been named director of the **University of Oklahoma Research Institute.** During the war he was chairman of the products research division, war metallurgy committee, National Research Council, and later was appointed chairman of the committee on ship construction of the division of engineering.

—o—

Julius H. Strassburger, manager, service and maintenance department, and **William F. McGarrity,** assistant to the manager of the steel works department, **Weirton Steel Co.,** Weirton, W. Va., have left for a tour of the western countries of Europe. They will study the use of oxygen in steelmaking, along with other phases of European steel practices.

—o—

Frederick J. Sammerdyke has been

FREDERICK J. SAMMERDYKE

elected executive vice president of **Gunnison Homes Inc.,** prefabricated housing subsidiary of U. S. Steel Corp. at New Albany, Ind. He has been associated with Gunnison Homes for more than two years. He joined the company as assistant to the president and as patent counsel. The post of secretary was added to his duties a year ago.

—o—

John L. Sinclair has been appointed Cleveland district manager, mechanical goods division, **Goodyear Tire & Rubber Co.** He has been associated with the division since 1924.

OBITUARIES...

Charles S. Traer, 59, chairman, **Acme Steel Co.,** Chicago, died Oct. 25. He had just completed 40 years of service with the company. He became president in 1941, serving until April, 1943, when he was elected chairman of the board.

—o—

Hubert Lenhart, 46, died in Long Beach, Calif., Oct. 18. He went to California from Pittsburgh in 1942 as Kaiser Co. Inc., iron and steel division, in Fontana. He become vice president of **H. A. Brassert Iron & Steel Co.,** iron and steel consultant, in January, 1949, representing its New York offices on the West Coast.

—o—

Irpin Oglebay, 73, chairman of **Oglebay, Norton & Co.,** Cleveland, died Oct. 23. He joined Hoffman Bridge & Foundry Co., Cleveland, as secretary in 1903. When this organization became the Ferro Machine & Foundry Co. in 1906 he was elected president, retaining that position until 1920, when he was elected chairman of the board, which position he relinquished in 1946. In 1924 he was elected president, Oglebay, Norton & Co., succeeding his uncle, Col. Earl W. Oglebay. Mr. Oglebay was an official or director of 22 other corporations.

—o—

Roy L. Comport, 56, Milwaukee district manager, **National Steel Co.,** Chicago, died Oct. 24 following a heart attack. He had been with the company for 21 years.

—o—

Kenneth J. Cole, 49, Chicago district manager, **Pressed Steel Co.,** died Oct. 24. He had been with the company since 1931, and during World War II had served with the Container Division, War Production Board, in Washington.

—o—

B. A. Patch Jr., 50, Chicago district manager, **Ohio Ferro-Alloys Co.,** died Oct. 17 of a heart attack.

—o—

Irving L. Morris, 84, former treasurer, **Ludlum Steel Co.,** Watervliet, N. Y., died Oct. 18. He was credit manager of Ludlum Steel and later was named treasurer. Mr. Morris retired a year after the merger of Allegheny and Ludlum steel interests.

—o—

Austin S. Murray, 74, for many years general manager, export department, **General Motors Corp.,** in New York, died Oct. 10. He retired in 1925.

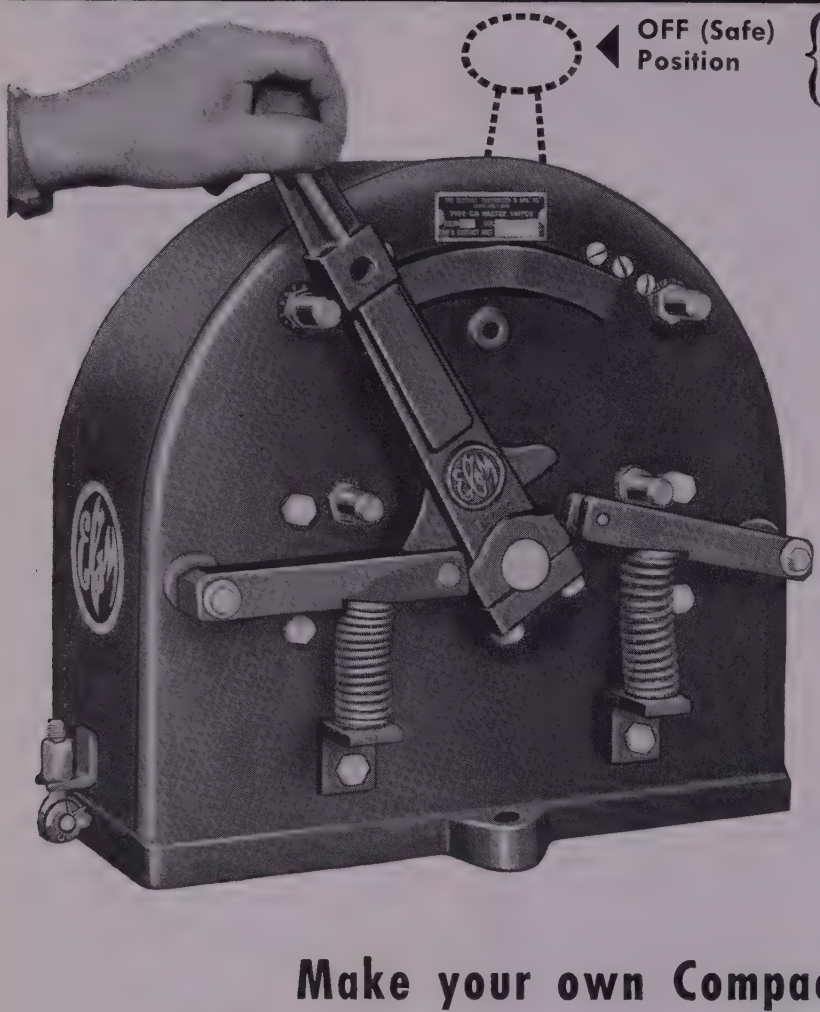
—o—

H. Norman Hoyt, 67, retired purchasing agent, **Anaconda Copper Co.,** New York, died recently at his home in Red Bank, N. J.

—o—

Earl F. Reinhart, 51, president, **Republican International Co.** of New York, tool and machinery firm, died recently in New York. His home was in Michigan City, Ind. He had long been identified with the tool industry and among other affiliations had been a vice president of Latrobe, Pa., Tool Co. from 1931 to 1933, and vice president of United Drill & Tool Corp., Detroit, from 1933 to 1940.

Master Switch *automatically* returns to Off-Positio from any speed-point in either direction . . .



Provides Safe Operation should ope ator fall or otherwise remove h hand from master-handle.

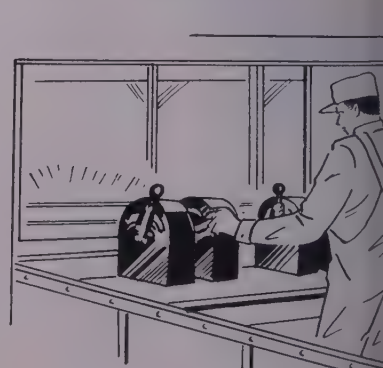
There are several *speed-contr* applications where *safe* practic dictates that power be automaticall disconnected from the motor-drive machine the instant the operato leaves his station or for some othe reason removes his hand from th master switch. A typical example i a transfer (or larry) car with a *spring return* master switch mounted on th side within reach of the operator a he walks along with the car. Shoul he trip and fall, the master switc automatically centers itself in the o (safe) position.

The EC&M Cam-type Master Switc (as illustrated) is ideal for this servic because of the *short-throw* of th operating handle. From the "full-on" to the "off" position, the handle of a EC&M Master travels less than 40 from the sixth speed-point in eithe direction to the off (central) position There's nothing to equal the EC&M Cam Master Switch for spring-retur service.

Make your own Compact Layouts with EC&M Bulletin 1190 Cam MASTER SWITCHES

in Crane-cabs or Mill-pulpits

For new installations or when re-vamping existing equipment, take advantage of the narrow width and short-throw of EC&M Cam Master Switches for improved performance. These features appeal to operators.



Write for Bulletin 1190 giving details of these short-throw, narrow width Masters

THE ELECTRIC CONTROLLER & MFG. COMPANY

2698 E. 79th STREET — CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

ED CONTROLS CASE DEPTH— Uniformity of case depth the work processed through an R-F hardening system deloped by Westinghouse Electric Corp., Pittsburgh, is obned by controlled feed emanating from a horizontal rotatg scanner that feeds the work through a work coil and ay quench. The system, which selective hardens cylinical parts at rates up to 6 inches per second, is easily adtable for hopper feeding into an automatic loading device.

ECTRONIC TOUCH— An electronic device is employed actuate the control valve of an automatic welding head rrently in use at the Naval Engineering Experiment Stan, Annapolis, Md. At present development is employed for search in connection with welding electrodes supplied by search institutions. Another welding head developed here reported to work as a hydraulic jack released under load. semiautomatic unit, it consists entirely of hydraulic comnents minus any gears. A 6-year-old boy using the unit desited a neat looking bead on the first try.

VES MORE SERVICE— A lead alloy for use in the chrom- plating industry, developed by National Lead Co., New rk, promises to give considerably longer service than those tals it replaces in both industrial and decorative plating erations. When used for tank linings, anodes and heating- d-cooling coils, the company states, the alloy is substantiy more resistant to the corrosive and pitting action of romic acid solutions. Also, it makes anodic treatments of lings and coils unnecessary.

G HEATER— Billet heating furnace at Colorado Fuel & n's new rod mill in Pueblo, Colo., gobbles up approxiately 60 tons of billets per hour. Hearth of the unit is 69 t long and 26 feet wide. Walls are encased in steel bindings d include vertical expansion joints to allow brickwork to pand freely without rupturing the steel binding when the it is brought up to operating temperature. Roof is comtely suspended from the steel framework, and refractory nger tiles are employed to hold roof brick in place.

CILITATES CABLE MAKING— A cable vise developed at Naval Air Station, Alameda, Calif., facilitates manufacre of wire rope, according to the Department of Defense, Washington. It holds each wire tightly and prevents twistg, making it possible to measure each wire and cut it to proper length for making up into cables. The vise may moved up or down the work bench to hold any length or mber of wires.

RTHER STUDY NEEDED— Physical and mechanical operties of the coating as well as the basic metal should well known in order to utilize pre-plating techniques, rold J. Read, associate professor of metallurgy, Pennsylnia State College, pointed out recently. This he said is ecially true in manufacturing operations involving extense deformation of metal. One of the prime functions of y electrodeposited coating is to provide protection against rosion. Until recently, only chemical properties received ention. It is now suspected that at least one mechanical operty of the deposit, namely, amount of internal stress, rkedly influences corrosion rate.

ENGINEERING "TOOL" — One of the newest alloys developed by International Nickel Co.'s Huntington, W. Va., works is reported to be suitable for many types of engineering applications at all temperatures from subzero to about 1200° F. An age-hardenable form of Inconel, it is particularly adaptable for parts of aircraft turbines and heat engines that require high strength and low plastic flow rate at temperatures above 1500°. Although it cannot be machined as easily as softer metals, it can be machined at practical rates. The metal also can be forged without difficulty, steam hammers being especially suitable for the job as the work can be handled rapidly with minimum chilling. (p. 46)

ATTRACTIVE SURFACES — Although color appearance of a properly chemically-polished aluminum surface resembles that of a bright chromium plate, almost as attractive surfaces are produced by the process on impossible-to-buff, regular mill-finished metal. Physical appearance of chemically processed surfaces varies widely depending on the original condition of the surface, alloy involved, and operating conditions during treatment. Chemical polishing occurs with dissolution of aluminum ranging from 0.0002 to 0.001-inch of surface thickness. Deep mechanical abrasions in the work cannot be removed because the method does not flow metal. (p. 53)

ANTI-"CLINKING" STAINLESS — When heating stainless steel ingots, care must be exercised to prevent great temperature differences between the surface and center of each ingot. If heated fast, the outside of the ingot may become very hot and expand more rapidly than the inside. Result is the metal may tear apart forming a defect known as a "clink". This defect may be avoided by slow heating and preheating. Exact procedure employed depends on type of steel, size of ingots. Individual ingot composition determines if preheating is required. If not, ingot is charged in a cold furnace and heated gradually. Average time of holding a 10-inch ingot at a predetermined temperature is about 5 hours. (p. 64)

Fig. 1—Expanded bellows for airplane engine exhausts.. These Inconel "X" parts were made by E. B. Badger & Sons

SEARCHING for a strong alloy which would be resistant to chemical corrosion and oxidation, and have low magnetic response, International Nickel Co.'s Huntington, W. Va. Works recently evolved a new age-hardenable form of Inconel. The new alloy is suitable for many types of engineering applications at all temperatures from subzero to about 1200°F. Designated Inconel "X", the new metal is particularly adaptable for parts of aircraft gas turbines or other gas turbines and heat engines that require high strength and low plastic flow rate at temperatures up to or above 1500°F.

Forging—The new material can be forged without difficulty. Because of its high strength at high temperatures it requires heavier equipment than would be used for similar work on ordinary steels. Forgings have been made by many drop forging firms and none has encountered any unusual difficulties. Turn round billets supplied by the Huntington Works such sizes as 8½-inch diameter by 24 inches lo 10½-inch diameter by 26 inches long, 11½-inch dia eter by 30 inches long, have been successfully up into simple flat disks and also in contoured dies fr 18 to 29-inch diameter by 3 to 6 inches thick.

Steam hammers are well suited for working t metal because work can be handled rapidly with minimum of chilling. When the alloy is forged presses, the metal is in contact with the dies or bloc for a relatively long time and the surface layers m be chilled to temperatures below the correct hot wo ing range. The work should be reheated as f quently as may be necessary to maintain unifo temperature throughout the piece and to avoid r tures arising from localized chilling.

Recommended techniques for forging, machining and welding International Nickel's new high temperature alloy demonstrate the material's adaptability for such parts as gas turbine rotor wheels, blades and vanes and for jet engine and rocket motor components

lloy Meets Many ngineering Specifications

n forging, it is recommended that the metal be ated in a furnace whose temperature is held at 5°F but not above this temperature. Forging ould be carried out from this temperature down to 0° F or possibly 1800° F. Below 1800° F the metal stiff and hard to move. It is recommended that the rk be returned to the heating furnace and reheated 2225° F whenever the piece drops below 1900° F. nperature control is perhaps a little more critical larger forgings and these require greater care to sure the work is thoroughly heated.

Heating furnaces at Huntington Works are run at o 4 per cent CO in sulphur-free gas. Good results be obtained in practically neutral atmospheres, up to 0.5 per cent O_2. Where heating furnaces fired with high sulphur fuel such as bunker oil, definitely oxidizing condition must be maintained, a clear fire with 1 to 2 per cent O_2 in the flue gas.

When billets or bars are heated for forging, it is t practice to support the pieces on rider bars out contact with any slag, scale or cinder that may be the furnace bottom. Rider bars may be of nickel ed at Huntington Works and many forge shops), Inconel or stainless steel. Carbon steel riders tend to scale rapidly at the temperatures required for heating Inconel "X".

Forgings should be handled in such a way that they will cool in air. Forgings should not be piled so that the cooling rate is retarded. Retarded quenching in hot water or warm oil may be used on medium size sections if it is thought important to hold the hardness low at this stage. Large sections, e.g. 10-inch diameter, may crack if quenched due to too rapid imposition of stresses arising from differentials of temperature. Current rolling mill practice is to quench rods off the hot mill in sizes from ½ up to 4½ inches. Large sizes, e.g., 8 x 8-inch billets, and small size wire rods, are not quenched.

Many heavy forgings are to be used at ordinary temperatures up to 1100°F. Such forgings may be stress equalized by charging hot into a furnace at 1650°F and holding. This practice has given good results on 700 to 900 pound disk forgings.

Since the metal derives its high temperature properties from heat treatment, it is definitely harmful to apply the so-called "hot cold work" by forging at temperatures in the 1200-1600°F range. This practice should be avoided.

Machining—The metal is a strong and tough alloy and cannot be machined as easily as softer metals. It can, however, be machined at rates that are entirely practical. Many machine shop operations have already been applied successfully to the alloy. The alloy is machineable in all conditions. Whether a specific part is to be machined from solution treated, partially age hardened, or fully age hardened material, depends upon the amount of stock to be removed, upon the finish desired.

In general, for rough machining, where it is desired to remove metal fast with large cuts, this can be done most readily in the rolled and solution treated or forged and solution treated conditions. (140-277 BHN. Hardness varies widely with rate of cooling.)

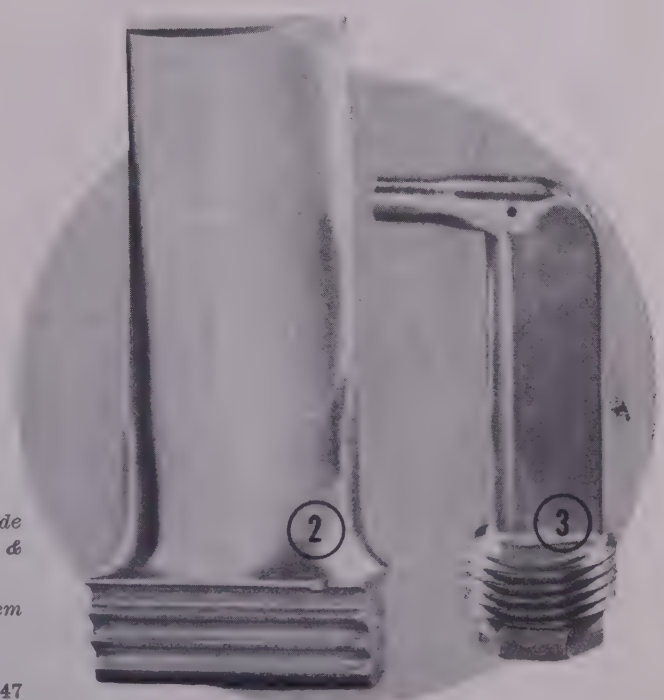


Fig. 2—Small forged and machined gas turbine blade for Westinghouse engine, manufactured by Pratt & Whitney

Fig. 3—A forged instrument part for jet engine system made by Pratt & Whitney

In this condition, the surface may tend to drag and the finish will not be smooth.

When deciding upon the proper condition of heat treatment from which a given part is to be machined, consideration should be given to the nature of the machining operation. Where small diameter holes under ⅛-inch are to be drilled, partially or fully hardened material will present drilling problems. Internal and external threads are difficult to produce in the material in either of those conditions. Where feasible, grinding of threads may be employed.

Heavy, sturdy machines and tools should be employed for satisfactorily machining the alloy. Machines, fixtures, and tools must be strong enough to reduce any chatter or vibration to the vanishing point. Unless this is done, tool life, production rate, size and finish of the parts being made, will suffer.

Cutting-Off—Inconel "X" is readily cut off with aluminum oxide, rubber bonded, abrasive cut-off wheels up to practical limits of size. At the Huntington Works, anything above 6-inch diameter is parted in a lathe. The metal has been cut on power hack saws and machine saws in the soft condition up to diameters of approximately 4½-inches, but this method is slow and it also results in rapid wear of hacksaw blades and machine saw cutters. Parting on a lathe appears to be a more practical method of cutting in sizes where the abrasive cut-off wheels cannot be used. Sheet, strip and flats in the nonage-hardened condition up to ⅛-inch thick have been cut by friction sawing. Standard carbon steel friction band saws with raker set teeth were used.

Turning and Boring — Solution treated material (hardness 77 Rockwell B to 29 Rockwell C—140-277 BHN) is turned with cast nonferrous tools such as Stellite grade 98M2 at 40 feet per minute using up to 0.025-inch feed per revolution. Material in this condition is also turned with cemented carbide tools between 65 and 80 fpm using feeds of 0.015-inch per revolution. Carbide tools such as Kennametal Co.'s grades K3H and K4H or Carboloy Co.'s grades 78B and 907 are suggested.

Age-hardened Inconel "X", including both partially aged and fully aged material (hardness 13 Rc or higher) is turned with the same type tools as those used for turning solution treated material. Speeds on the order of 20 to 30 fpm with feeds up to 0.015-inch per revolution are used for cast nonferrous tools. Speeds between 60 and 70 feet per minute with like feeds are used for cemented carbide tools. High-speed steel cutting tools are not generally recommended for turning Inconel "X".

Drilling—Drilling operations are not recommended on the metal in the fully age-hardened condition. If this becomes a must, use conventional heavy duty web H.S.S. twist drills ground to an included drill point angle of 130-135 degrees. Grind down heel of the drill at the drill point slightly to permit free entry of chips into the flutes, and thin the web at the drill point about 40 per cent of its original thickness. The operating speed of the drill should be in the neighborhood of 10 fpm.

Material in the rolled solution-treated or forged solution-treated condition and the partially age hardened condition can be drilled with conventional H.S twist drills ground to an included point angle of to 130 degrees. The grind at the heel and the of the drill should be in accordance with that pre ously indicated for drilling the material in the hardened condition. The surface speed of the d should be from 10 to 20 feet per minute. The f for drills ⅛-inch diameter and smaller should exceed 0.0015-inch per revolution. The feed for la er diameter drills progresses to 0.005-inch per revo tion. The increase in feed must be proportioned to diameter of the drill.

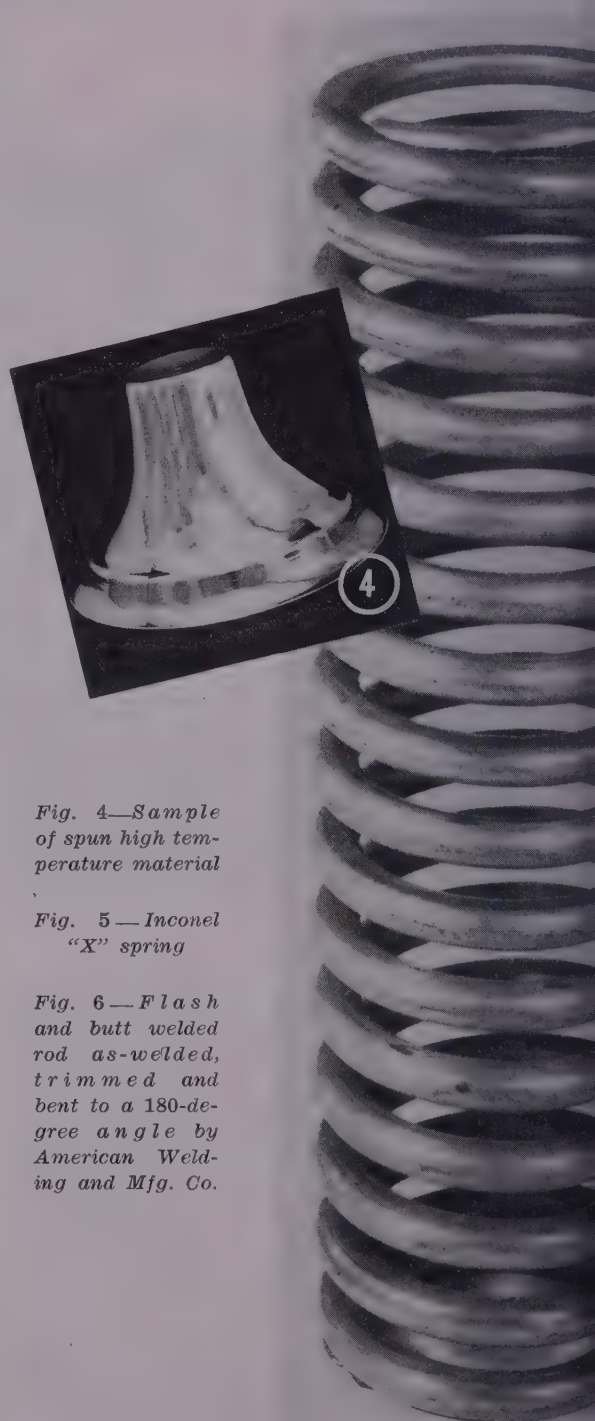


Fig. 4—Sample of spun high temperature material

Fig. 5 — Inconel "X" spring

Fig. 6 — Flash and butt welded rod as-welded, trimmed and bent to a 180-degree angle by American Welding and Mfg. Co.

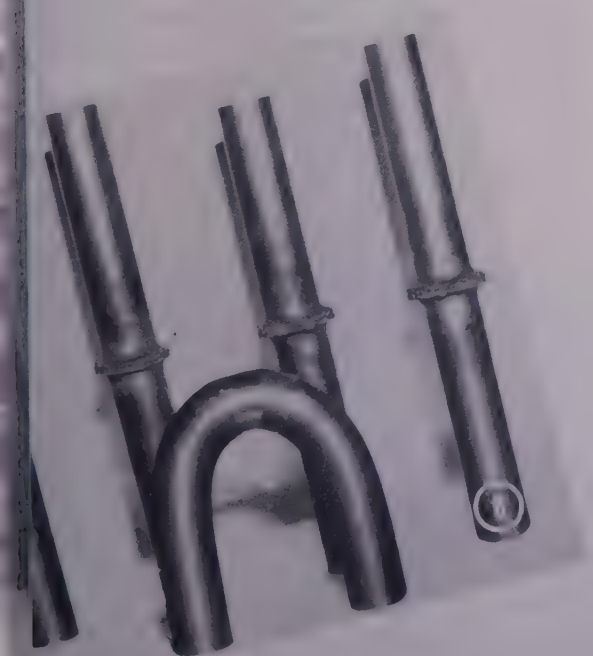
ingle-flute, deep-hole (gun type) drills tipped with
ented carbide perform satisfactorily on the metal
the partially age-hardened condition. Drilling
eds on the order of 80 to 100 fpm with feeds to
005-inch per revolution have proved satisfactory.
all diameter holes, say under ⅛-inch, are difficult
drill. Only solution treated material is recom-
ded for such drilling. Short drills should be used
all drilling operations and when possible, a drill
hing incorporated in the setup. Furthermore, the
k and drill should be flooded with cutting lubri-
t making every effort to get the coolant to the cut-
points of the drill.

illing—Experience on milling the alloy is con-
d to high-speed steel cutters. Surface speed of
speed steel cutters for milling operations should
eld to 20 to 40 feet per minute. Feeds should
n the order of 0.002 to 0.005-inch per cutter tooth.
lain or slab milling can be done with coarse tooth
ers having helical teeth ground to a rake angle of
o 13 degrees. Clearance on the periphery of the
h should not be more than enough to prohibit
. Face milling with high speed steel inserted
h cutters has been carried out quite satisfactorily
partially and full age-hardened material.

itting—Slitting is best performed with a stag-
d tooth saw with alternate teeth of opposite helix.
rance on the periphery of the teeth should be
to the minimum that prohibits dragging.

he material can be broached in either the solution-
ted partially age hardened or the full age hard-
condition. The age hardened material will cut
er but offer lower life per grind to the broach.
material in both conditions has been broached at
m. High speed steel of the 18-4-2 analysis has
used for the broach material. Broaches should
ardened and tempered to a hardness in the neigh-
ood of 64 Rockwell C scale.

elding—Several different types of welding op-
ons have been successfully demonstrated on an



experimental basis with the material in bar stock forms and in sheet and strip. Some commercial production welding has been done but the total experience to date is not sufficient for a basis of hard and fast rules.

The metal can be welded by nearly all commonly used methods including metal arc, inert gas metal arc, atomic hydrogen arc, resistance spot and seam, resistance butt welding.

Metallic Arc Welding—Sound welds having good ductility have been produced by hand welding the material with INCo "132" metallic arc electrodes. The welds have been x-rayed and found to be free of porosity and cracks. All fractures have been pore free and of normal silky appearance. It is well known that the high nickel alloys "freeze" very rapidly and this fact must be taken into consideration when welding with "132" Inconel electrodes. The majority of trouble, when it appears, is usually found in the restrike areas. Therefore, it is essential that the proper technique be used in making restrikes.

Each electrode, as it is inserted in the electrode holder, should be examined to be certain that the flux coating extends to the end of the core wire. Electrodes that have been slightly damaged at the end should be burned off to where the unfluxed area is eliminated.

A "T" type pick-up should be used for the restrike. This consists of starting the arc at the forward or leading edge of the crater and carrying the arc to the rear edge of the crater at a speed slow enough to allow the deposition of a small drag bead. When the rear edge of the crater is reached, weaving should start across the full weld width. Direction of welding is reversed and the welding carried on. As the arc makes its second or weaving traverse of the crater, the short drag bead will be remelted.

This type of pick-up has three major functions. First, it gives the welder an opportunity to establish the correct arc length before weaving starts. Second, it preheats the crater; any cold shuts or gas pockets present in the area directly over the crater are given an opportunity to escape when the second melting of the crater area takes place. The metal deposited in the small drag bead across the crater is quenched or frozen very rapidly and usually this solidification occurs before the gas can escape.

The condition wherein the gas is trapped in rapidly solidifying metal also exists in the crater as the forward half of the weld puddle is generally rather thin and when the arc is broken solidifies more rapidly than the full thickness bead. Gas or cold shuts in the crater arc area are removed by various abrasive wheels manufactured for the dressing or cleaning of welds. It is recommended that all craters be ground rather extensively before each restrike is made.

Inert Gas Metal Arc Welding — Acceptable welds joining 0.025 to 0.093-inch thick sheets have been made by the inert gas metal arc process, using either argon or helium gas for the inert atmosphere. The welding progresses readily, but reasonable care should be used to maintain an arc length not exceeding 0.125-inch. Helium is preferred slightly over argon. Whichever gas is used it (*Please turn to Page* 74)

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

SMALL LOT ECONOMY: Throughout the 17th annual meeting of the American Society of Tool Engineers which I have just been attending at Montreal, strong emphasis was placed by Payson Blanchard of The Bullard Co., and by several other speakers, on the fact that the economies possible through modern machine tools by no means are confined to big lot production.

This lesson applies to many industries in Canada which do not enjoy the mass markets available in the United States and which at the same time have to compete with mass-produced goods from the States. It is a lesson which should be heeded by production engineers in the United States who undertake to tool up—or dictate methods of tooling—branch plants in Canada. Costly setups which are economically justifiable in the States in many instances must be simplified for use on similar products in Canada.

My impression is that tool engineers of many limited production industries in the States—including machine tool builders—can learn much from Canadian tool engineers who are experienced in making high production machines serve multiple purposes which will keep them busy all the time. They also can learn much from Canadian product designers who have modified small parts for multiple production on big planers, surface grinders, milling machines, etc., which otherwise would be busy only part of the time machining big parts. In no other way could the big, expensive machines be justified.

The same philosophy applies to use of machines such as turret lathes in tool rooms. If enough attention is paid to how enough jobs can be handled on machines of that type, it will be found profitable to apply them to lots such as a dozen reamer blanks, for example.

CHAPIN FOREST: On October 15 I was among several hundred who attended the civic luncheon at which Mr. and Mrs. Fred H. Chapin handed to Gov. Frank J. Lausche the deed to the 361-acre Gildersleeve Forest, which they have presented to the state of Ohio. This tract, which is in the neighborhood of Cleveland, was destined for the lumberman's ax when the sudden and generous impulse of Mr. and Mrs. Chapin saved it for the benefit of the people of Ohio.

Most of us know Fred H. Chapin as a machine tool builder who for many years has been president of the National Acme Co. of Cleveland. Too few of us have known him as a nature-lover whose admiration for the beauty of unspoiled forests is combined with practical appreciation of what forest preservation me to the economic life of this country.

Years ago, when Mr. Chapin was a vice presider the Bourne-Fuller Co. of Cleveland, he had first-h experience with the costly troubles caused by the laden waters of the Cuyahoga river which winds twists through the heart of Cleveland's steel pro ing area. Rich soil eroded from denuded area the river's headwaters then did and still does c down to clog the pipe lines of the industrial pl and to "silt up" the navigable portion—requiring stant, costly dredging at taxpayers' expense.

Later on, in the fall of 1927, came the great f of the Connecticut river. One of the industrial tims of which was the Gridley Automatic plan branch of National Acme Co. then located at Wind Vermont. Nearly six feet of muddy water flo through that big plant. Years of heavy lumbe operations around the Connecticut lakes unquest ably contributed to this catastrophe—which in contributed to the giving up of the plant by Chapin's company.

In accepting the generous gift of the Chapins, ernor Lausche said: "Our nation is young. We h seen what has happened to Egypt, to Babylonia Greece. May we profit by that knowledge. Conse tion is the topic of today."

The lesson to be drawn from the "Chapin For case is that if the land is used properly in the ru upper valleys, rivers will cease to be a menace to dustries in their lower valleys. It is high time learn that lesson.

CAN IT BE ASSEMBLED? The case of the sh off who puts the billiard ball into his mouth and t discovers that "special tools" are required to rem it, is paralleled by a mechanical problem which demonstrated to me when I visited the K. R. Wi shop in Arcade, N. Y.

In designing automotive service tools, the engin of that organization discovered that the only poss way to get the "innards" in or out of a certain axle assembly is to stretch the opening—just a dentist stretches a patient's mouth when making impression.

Therefore, they set about designing a stretch tool which enables the internal mechanism to p through the opening. Having stretched the open they discovered that permanent set occurred wh threw things slightly out of line. To correct t condition they made their tool workable in reve so that after stretching, it would pull things back i alignment.

This is a good example of the troubles caused designs which look fine on paper but which give semblers and service men headaches and skin knuckles because the draftsmen failed to take i account the swing of wrenches and the room requi to introduce subassemblies through openings and i pockets.

There are several ways to forestall such diffi ties, in addition to practical visualization by dra men. An increasingly common method in the of mass produced items is to build mock-ups or mo prior to going into production.

UNUSUAL SCREW MACHINE OPERATIONS

Buick setups adapt automatics to machine long shifter lever, helical grooves on speedometer shaft with single-point tool and cross drill small stepped control valve

By HERBERT CHASE

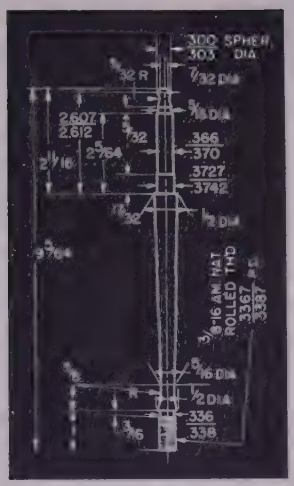


Fig. 1—Transmission control lever produced by Buick on an eight-spindle Conomatic

UNUSUAL and possibly unique screw machine operations are used in plant 28, Buick Motor Division, General Motors Corp., to turn out automobile components on a large scale. Probably 90 per cent of the screw machine output is produced on fairly conventional setups, but the other 10 per cent involves some extremely interesting tooling.

Most car makers use forged steel gear shifter levers but Buick simplifies production and avoids forging by making the lever itself, Fig. 1, in a multiple-spindle automatic screw machine and later adds to the shaft a ball, also a screw machine product. The shaft is SAE 1118 hot rolled steel and has a finished length of 2 7/64 inches which, for a maximum diameter of ½-inch is unusually long for production on an automatic. The ½-inch stock is purchased in coils and run through a Schuster straightening machine before cutting into bar lengths.

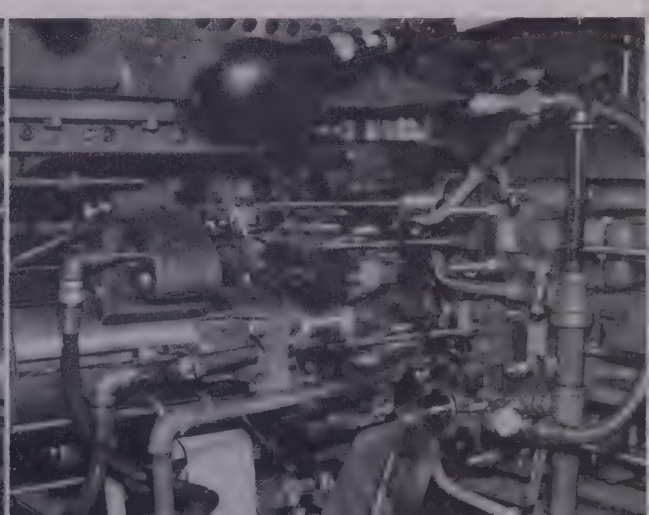
Eight-Spindle "Job"—Machining is done in an eight-spindle 1⅝-inch Conomatic. After feeding to length in the first position, the taper is partly formed in the second position and chamfering is done at thread end, Fig. 2. A roll support acts as a steady rest during this and subsequent operations. In fourth position, the ⅜-inch diameter is formed and the small diameter of the taper is finish formed. Then, in the fifth position, the thread diameter is turned and the 0.366-0.370 and the 0.3727-0.3742-inch diameters are shaved. In the sixth position, the 0.300-0.303-inch spherical radius is formed, as is also the 5/16-inch diameter while the end is faced and chamfered. Next, in the seventh position, the spherical radius and 5/16-inch diameter are shaved. This completes the screw machine operations except for cutoff done in the eighth position and the piece falls into a chute, Fig. 3. One hundred levers per hour are produced. The thread is then rolled in a Waterbury-Farrel machine.

After washing and then grinding off the teat, the lever goes through two Cincinnati centerless machines for rough and finish grinding the taper form as a preliminary to plating.

Tool Saves Operation—Unusual in some respects is the speedometer drive shaft. This part requires, on its outer bearing diameter, a helical oil groove of 5/16-inch lead. Until recently, this groove was produced after screw machine operations were completed but it is now cut in the screw machine, Fig. 4, by a single-point tool held in a conventional collapsible threading die head. This special tool is applied to a chaser head fed in from the end with the work held stationary (not rotating) in the fourth position of a

Fig. 2 (left)—Setup for control lever production as it appears from front of machine. Tooling at first four stations is shown

Fig. 3 (right)—Rear of Conomatic setup showing tooling at last four stations. A completed control lever just cut off is in the chute



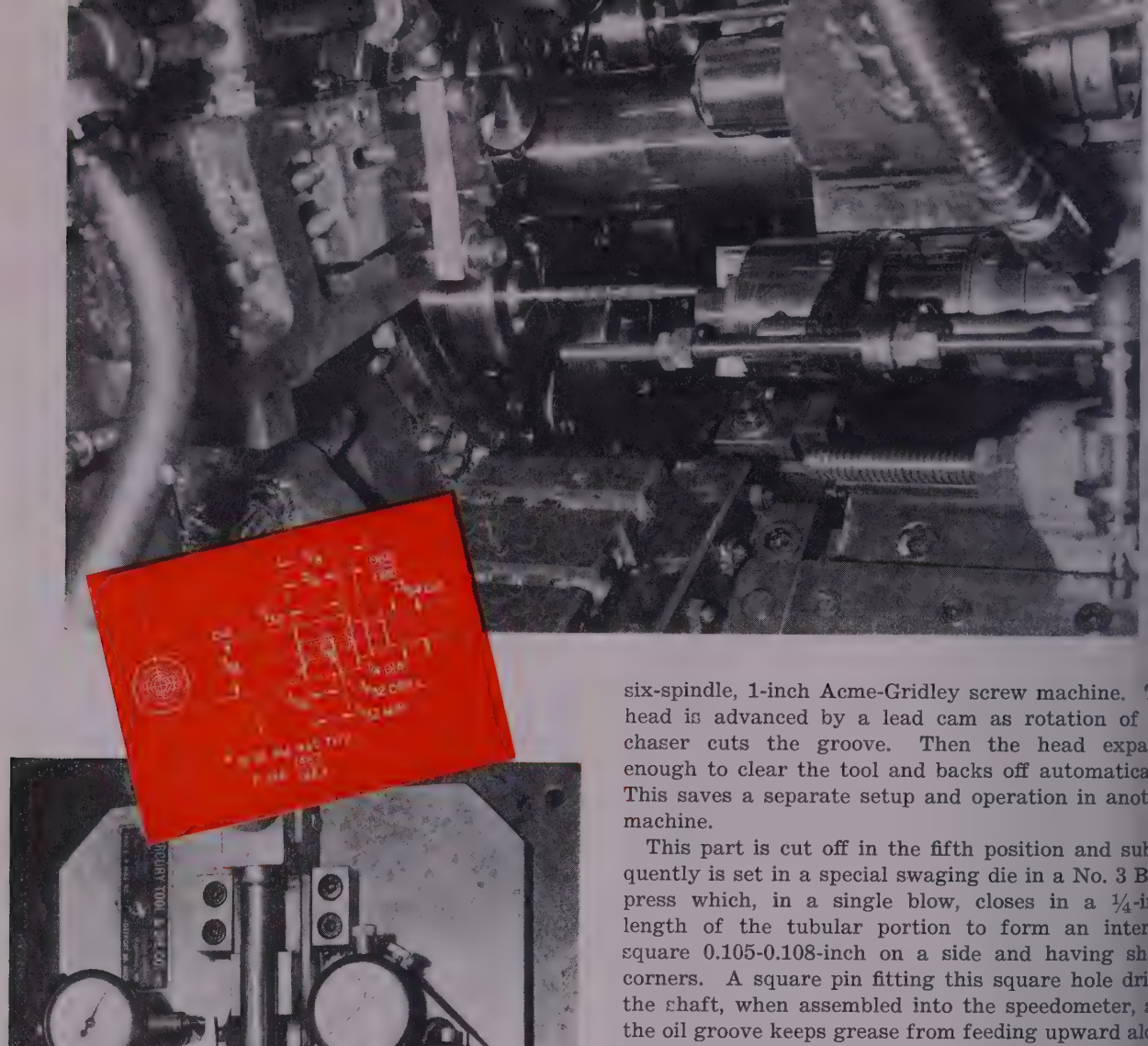


Fig. 4 (top)—Closeup showing part of tooling in a six-spindle Acme-Gridley, especially tooling at station in which the helical oil groove is chased on outside diameter of drive shaft

Fig. 5 (center)—Control valve wire trunnion produced in a six-spindle Acme-Gridley, including drilling of crosshole

Fig. 6 (bottom)—Fixture in which Dynaflow main control valves are gaged for overall length and length to each shoulder

six-spindle, 1-inch Acme-Gridley screw machine. T head is advanced by a lead cam as rotation of chaser cuts the groove. Then the head expa enough to clear the tool and backs off automatica This saves a separate setup and operation in anot machine.

This part is cut off in the fifth position and sub quently is set in a special swaging die in a No. 3 B press which, in a single blow, closes in a ¼-i length of the tubular portion to form an inter square 0.105-0.108-inch on a side and having sh corners. A square pin fitting this square hole dri the shaft, when assembled into the speedometer, a the oil groove keeps grease from feeding upward alo the shaft.

Cross-Drills in 2 Seconds—A part termed a cont valve wire trunnion, Fig. 5, is produced in a six-spin 1-inch Acme. Most of the operations are conv tional but cross drilling is performed in the seco position before the axial hole is tapped in the th position. Cross drilling is done in 2 seconds by 3/32-inch high speed steel drill driven at 3600 r by a separate motor mounted on a cross-slide. To time per piece is about 4½ seconds.

Valve spring cap keys are among parts made high speed in Brown & Sharpe 2-G screw machi from X-1112 cold draw stock. These keys are p duced as rings that are tapered on the outside dia eter with a form tool. After drilling, reaming a cutoff, the ring is automatically transferred to a sa ing attachment and is then cut in two with a 1/32 2-inch slotting saw having 72 teeth. The time p pair of parts is 15 seconds. Keys are tumbled emery stones to remove burrs before heat-treating

Main control valves for Dynaflow transmissions a produced at the rate of 100 an hour in multiple-spin machines having fairly conventional tooling but ov all length and distances from one end to all should have to be held within ±0.005-inch limits. The d gage setup, Fig. 5, is employed to check these dim sions rapidly.

Can You Use Chemical Methods in

FINISHING ALUMINUM?

Wide variety of protective and decorative finishes for aluminum can be produced economically by strictly chemical processes. Surface conversion coatings, frosted finishes, diffuse reflector finishes, various types of etched surfaces, chemically produced oxide coatings and a method for producing bright chemical polish on aluminum by dipping are described here

A GREAT variety of strictly chemical methods is finding more and more application in finishing aluminum. The use of adherent, inorganic protective coatings on aluminum has long been recognized as efficacious in reducing corrosion rate and prolonging paint life. Surface conversion coatings, which are formed by chemically converting the metallic surface have as their objective the formation of a stable and nonreactive coating, integral with the base metal, which inhibits corrosion and increases the adherence of applied organic finishes.

Chemical finishing methods also include the frosted finish, diffuse reflector finish, various types of etched surfaces and chemically produced oxide coatings. Recently a method for producing a bright chemical polish on aluminum by a dipping operation was described.[1] Chemical finishing processes can produce surface effects not possible by mechanical or electrochemical methods.

Surface Conversion Processes—Surface conversion

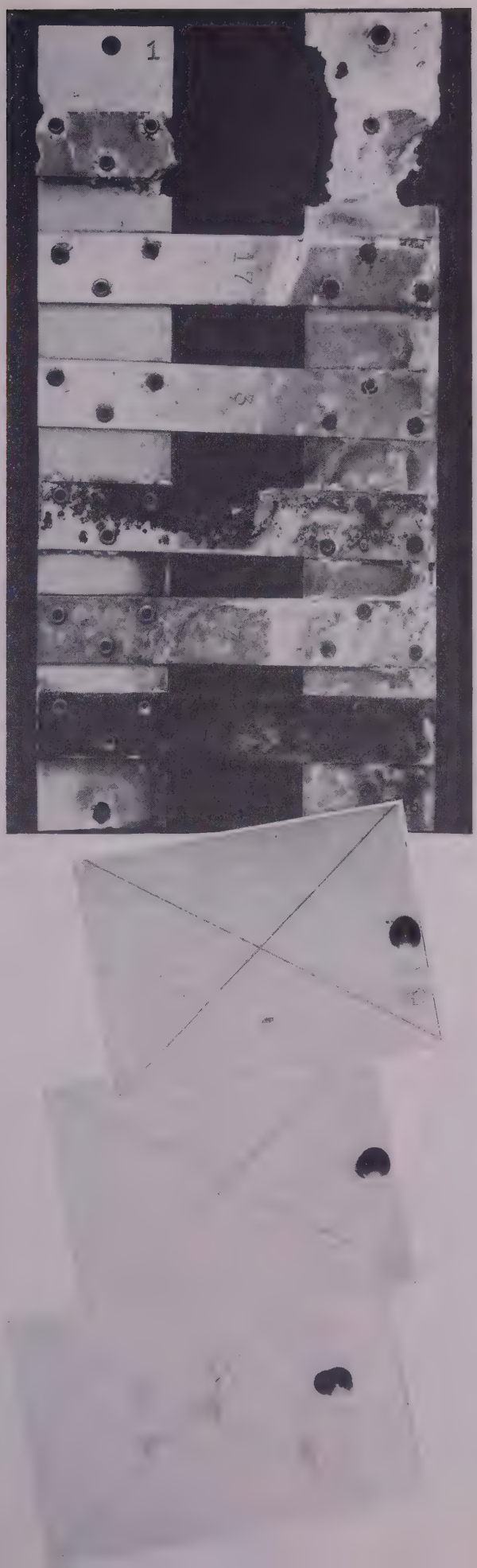
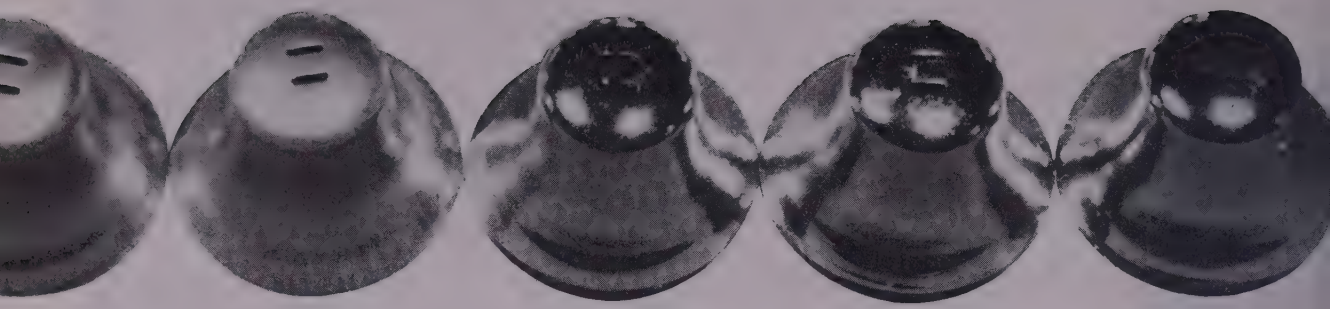


Fig. 1 (above)—Tests showing effect of proper chemical treatment in preventing couple corrosion. The 2S aluminum strip on left (1) was chemically treated to produce an amorphous phosphate coating, while one at right was untreated. Various metals were used as cross pieces. Exposure time was 21 months on a roof in a semi-industrial atmosphere

Fig. 2 (right)—Panels shown illustrate effect of chemical treatment on salt spray of panels painted with a single coat of white synthetic enamel designed for washing machine use. From top to bottom, panels were given amorphous phosphate coating treatment and 22,000 hours salt spray; chromic acid anodized and 5800 hours salt spray; chemically oxidized and 2400 hours salt spray



processes are the only methods in use which prepare the surface of aluminum as a good base for an organic finish. Some of the common methods of converting aluminum surfaces not involving electrochemical anodizing operations are acid etching, treatment with phosphoric acid-organic solvent mixture, production of chemical oxide coating and formation of phosphate coating.[2] One type of phosphoric acid-organic solvent mixture is a surface preparation made up of an aqueous solution of phosphoric acid with organic grease solvents and emulsifiers. The mixture is usually applied by brush-on or dip, and probably forms a thin film of aluminum phosphate on the surface of the metal. (U. S. Army Corps of Engineers specification T-1184-D.)

Oxide coatings may be produced on aluminum surfaces by certain chemical treatment processes. Patents pertaining to some of these processes have been granted to Aluminum Co. of America. One method specifies immersion of the work in a hot (about 150° F) solution of 2 per cent sodium carbonate and 0.1 per cent potassium dichromate for a period of about 20 minutes. Pores of the oxide film thus formed are sealed by a subsequent immersion in a hot solution of 5 per cent potassium dichromate and the parts are then rinsed.

The absorbed dichromate neutralizes any residual alkali in the coating and tends to increase its protective power. Oxide films so formed have been reported to vary in color, depending on the alloy treated, but are usually a yellowish-green after sealing in dichromate. Oxide coatings produced by chemical means are thinner, softer, and more por than those obtained by anodic processes. Howe in general they are more economical and easier apply. These coatings may be dyed; however, it been reported that the colors obtained are not good as those on electrochemical oxide films.

More recent developments in chemical meth for finishing aluminum has been the chemical p duction of phosphate surface coatings. In one me od[2] of this kind, known commercially as Bonder developed by Parker Rust Proof Co., Detroit, co ings consisting essentially of zinc and aluminum ph phates are formed on the aluminum surface by tre ment with zinc phosphate solutions containing fl boric acid. Recently, data were presented[4] on "Alodine" process which is described by Ameri Chemical Paint Co., Ambler, Pa., developers of process, as producing an amorphous phosphate co ing on aluminum surfaces. One outstanding feat of this chemically treated surface is said to be a h degree of salt spray corrosion resistance on painted aluminum.

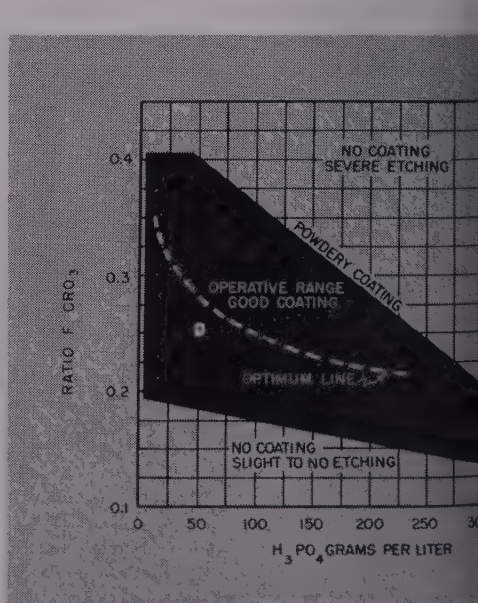
Bonderite Process—The Bonderite phosphate co ing process may be carried out by immersion spray application in the same type of equipment with similar cycles as used for processing steel zinc. Production of the coating involves the follo ing typical steps: (1) Clean work thoroughly immersion in a mild inhibited alkaline cleaner, solvent cleaning, or vapor degreasing. (2) Imme cleaned and rinsed metal in the Bonderite solut maintained at a temperature of about 160° F,

Fig. 3 *(above)—Alloy* 3*S aluminum bells before and after chemical polishing by a dip treatment. Note high degree of specular reflectance from the chemically treated bells on right. Courtesy Enthone Inc.*

Fig. 4 *(right)—Chart from U. S. patent* 2,438,877 *showing operative ranges and solution composition for producing the amorphous phosphate Alodine coating on aluminum*

Fig. 5 *(right, center)—Weight in milligrams per square foot, of coating at various times and temperatures by immersion application of Alodine*

Fig. 6 *(far right)—Aluminum dissolution rates in acid solutions appear to be related to ability to chemically brighten the surface. Results obtained for a typical alloy in tests recently conducted in Enthone Co. laboratories are shown.* (120° *C, mild agitation*)



minutes. This converts the metal surface to a orm phosphate coating. The solution has been ribed as containing zinc phosphate, nitrate and borate. (3) Rinse thoroughly in cold water for t 30 seconds immediately after treatment in phosphate coating bath. (4) Immediately after water rinse, the work is rinsed for about 30 nds in a dilute solution (about 0.05 per cent) hromic acid (sometime phosphoric-chromic mix- is used here), maintained at a temperature of t 180° F. (5) Dry parts thoroughly prior to ting.

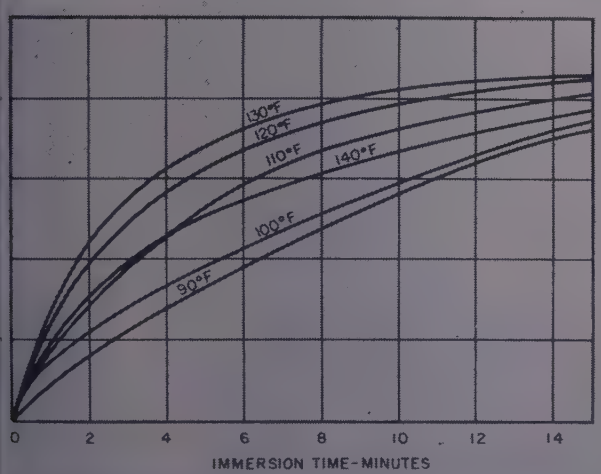
he phosphate coating weights obtained by the ess are reported to vary from 100 mg. to 2 ns per square foot of surface area, depending he method of application of the coating solution the type of metal pretreatment used. Outstand- features of the process are that it aids paint horage appreciably, and tends to prevent paint failure.

Iodine Process—This process, described as pro- ng an amorphous phosphate coating on alumi- surfaces, was first introduced by American mical Paint Co. early in 1945. Data recently ented on the coating process[4] indicate that the constituents of the coating are chromium phos- te 50-55 per cent; aluminum phosphate 17-23 cent; water 22-23 per cent. From these analyses, ight be assumed that the coating would have conventional crystalline structure associated with r types of phosphate coatings. However, ac- ing to work carried out by American Chemical t Co., microscopic examination, as well as both y and electro-diffraction studies have failed to v any crystalline pattern or definite defraction ern.

ocessing Steps—Steps recommended for produc- the amorphous phosphate coating known as the line coating consist essentially of the follow- (1) Remove surface contaminants by essen- y conventional means. (2) Rinse free of any ad- ng alkali. (3) Treat for a short time in the Alo- solution. This solution consists essentially of ixture of chromic, phosphoric, and hydrofluoric acids in certain well defined proportions. Fig. 4, a chart reproduced from U. S. Patent 2,438,877 gives the operative ranges of the solution in terms of phosphoric acid concentration and the ratio of $F:CrO_3$ for solutions prepared with an alkali fluoride. (4) If the aluminum being processed is not to be painted, for maximum corrosion resistance it is dried at elevated temperature without rinsing, For this application the process is considered complete at this point. (5) If the aluminum is to be painted the work from steps 3 or 4, above, is rinsed with clean water. (6) work is given a final rinse in dilute chromic or phosphoric acids, or a mixture of both. (7) Work is dried. Coating may be applied to aluminum surfaces by immersion, spraying, or even by brushing. The developers of the process have pointed out that considerable latitude is allowable in the concentration of all components of the solution without adversely affecting its coating properties.

Proper Cleaning Important — In general, cleaning procedures prior to the phosphating operation may be of conventional type. However, it is important that traces of adhering alkali be removed by very thorough rinsing, as they cause the formation of a loose and powdery coating on the surface. Use of a slightly acidulated rinse is preferable. Instances have been cited where improper rinsing has resulted in contamination of phosphate processing solutions.

Coating Thickness—Generally, weight of the amorphous phosphate coating increases with processing time, bath strength, and bath temperature. This is shown graphically in Fig. 5 for the immersion type of treatment. It has been pointed out that ordinarily there is no perceptible change in the overall dimensions of the metal processed because the thickness of the coating is about equal to that of the aluminum dissolved. However, since the amorphous phosphate coating has a greater density than aluminum, there is an overall gain in weight of processed metal.



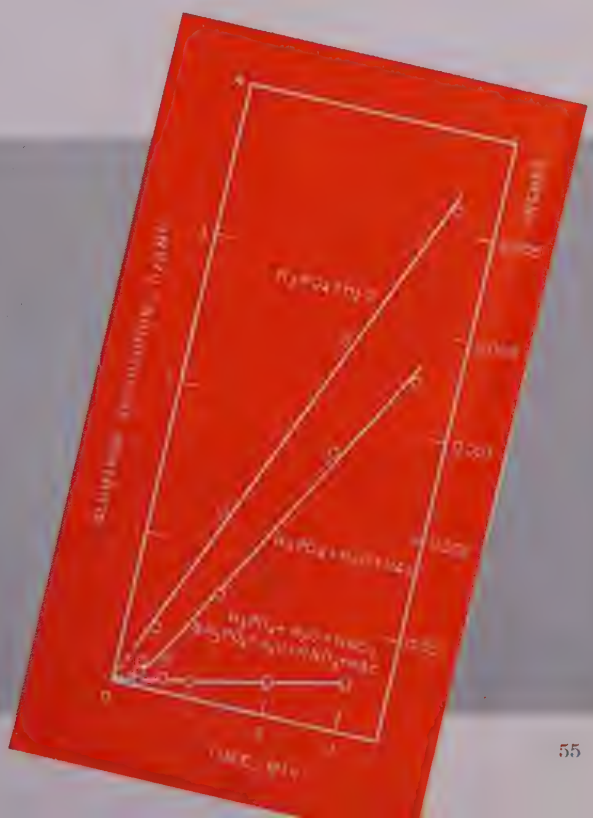


TABLE I

COMPARATIVE SALT SPRAY RESISTANCE RATING AFTER 1500 HOURS EXPOSURE

Aluminum Surface Coating or Treatment	Type of Paint System	
	Baked Enamels	Air-Dry Enamels
Chromic Acid Anodized		
Non copper bearing alloys	9.7	7.0
Copper bearing alloys	8.0	5.5
Sealed Alkaline Chromate-coated		
Non copper bearing alloys	8.0	6.0
Copper bearing alloys	5.5	4.0
Zinc Phosphate Coated		
Non copper bearing alloys	6.5	4.0
Copper bearing alloys	5.0	2.5
Solvent wiped only		
Non copper bearing alloys	3.5	1.5
Copper bearing alloys	1.0	0

In this table a rating of 10 indicates no visible failure; 0 indicates complete failure.

Salt-Spray Resistance — Primary importance of many chemical treatment processes for aluminum is their paint bonding and under-paint corrosion-inhibiting properties. However, data available[4] on salt spray resistance of unpainted Alodine treated aluminum surfaces show this type of chemical treatment to impart a considerable degree of corrosion resistance when used without subsequent application of organic finishes. The result of tests conducted by American Chemical Paint Co. on the salt-spray resistance of treated aluminum, subsequently painted is shown in Fig. 2. It depicts three panels of 52S aluminum alloy, each painted with a single coat of white synthetic enamel designed for washing machine use. These panels were respectively (top to bottom, beginning with A9) Alodized, chromic acid anodized, and chemically oxidized by a proprietary process. It was reported that the elapsed time to removal from salt spray were respectively 22,000 hours, 5800 hours, and 2400 hours. Table I based on American Chemical Paint laboratory tests shows the comparative salt spray resistance of several different types of chemically treated surfaces, subsequently painted.

Couple-Corrosion — Chemical coatings of the amorphous phosphate type on aluminum have been shown to have a very high surface resistance. This indicates an application for protection against bi-metallic or galvanic corrosion. Fig. 1 shows the results of tests conducted by the American Chemical Paint Co. to determine the insulating effects of the amorphous phosphate coating with respect to several different metals. Referring to this figure, the strip on the left, uncorroded, is 2S aluminum chemically treated to produce the amorphous phosphate coating, while that on the right is uncoated.

Strapped between the strips are different metals attached with hollow brass rivets. The whole "ladder" of test pieces was exposed for a total of 21 months on a roof in a semi-industrial area within 100 feet of a much used railroad. In addition, in order to accelerate the effect, it was also exposed to 150 hours salt spray. The cross pieces in Fig. 1 are, reading from the top, as follows: Magnesium, untreated (corroded away); 17ST aluminum; 3S aluminum; chrome plated steel; galvanized iron; and tin plated steel.

It can be noted that in all cases there is notably less corrosion of the coated strip at the points of bi-metallic attack than on the untreated strip, showing that the treated strip offers considerable protection against galvanic corrosion.

Chemical Brightening Aluminum— Recently, research work carried out a method for chemical brightening and polishing of wrought aluminum alloys has been reported.[1] The studies made under this program showed that mixtures of phosphoric acid, nitric acid and water had the property of brightening and polishing, when wrought aluminum alloys were immersed for varying lengths of time, 15 seconds to 10 minutes, at temperatures ranging from 210 to 280°F. The fact that certain acid solutions will brighten and polish while others will merely etch wrought aluminum alloys appears to be related to the solution rate of the alloy. Fig. 6, based on recent work conducted in the Enthone Co. laboratories shows the rate of dissolution of a typical aluminum alloy in acid solution. Reduction in solution rate with the addition of nitric acid is accompanied in most cases by an increase in brilliance of the finish obtained.

Experiments were carried out which included a comparison of the dissolution properties of the high copper, high magnesium, and the commercially pure aluminum alloys in four different baths. The composition of the four different baths, studied, expressed in gram moles per liter, was as follows: Phosphoric acid-water solution consisted of 13.4 per cent phosphoric acid (ortho) and 17.9 per cent water. The phosphoric acid-water-acetic acid solution consisted of 11.7 per cent phosphoric acid, 15.6 per cent water and 2.6 per cent acetic acid; the phosphoric acid-water-nitric system was made up of 13.4 per cent phosphoric acid, 17.0 per cent water, and 0.58 per cent nitric acid; the four-component, phosphoric acid-water-acetic-nitric system was composed of phosphoric acid 11.3 per cent, water 14.8 per cent, acetic acid 2.6 per cent, and nitric acid 0.50 per cent. Results obtained in the experiments with respect to the surface finish on aluminum are summarized in Table II.

Chemical Polishing of Aluminum — Chemical polishing of aluminum on an industrial scale from solutions composed primarily of phosphoric acid, nitric acid, and water may introduce the finishing engineer to an entirely new set of operating problems. A few that must be considered are as follows: (1) Operation of baths at elevated temperatures produces high vaporization losses which not only produces an unusual exhaust problem but also changes the bath composition; (2) time and temperature to reach the optimum brilliance of finish will vary with the alloy and perhaps with its temper; (3) drying must be accomplished without water spotting; and (4) materials for the construction of equipment must be carefully selected.

According to the work reported from the Enthone Laboratories[1] the variables are known to affect the finish obtained on a given aluminum part. They are: Chemical composition of the bath, operating time and temperature. In order to determine the proper conditions to use for a specific aluminum part with a given solution composition, test runs should be made in the plant to determine the optimum cycle. Thus, typical parts to be processed should be dipped for varying times at various temperatures.

In using a bath of the basic composition described above, it has been suggested[1] that the range of 180 to 280° F be covered, with dipping times of from 15 seconds to 5 minutes. It is important that these tests be made on the actual parts since spinning, drawing, and other forming operations appear to change the temper sufficiently to have an effect on the polish. From the practical standpoint it is generally advisable to operate the bath at the lowest possible temperature that will give polishing in order to minimize vaporization loss.

Recommended equipment for chemical polishing baths of the acid type is stainless steel tanks and racks employing welded assembly. Stainless alloys 321 and 237 have been successfully used in tank construction. A satisfactory heat source should be provided. Some chemical polishing baths for aluminum, notably the phosphoric acid modification of the phosphoric acid, nitric acid, water combination liberate sufficient heat during the polishing reaction that they must be cooled in operation. In addi

WHY

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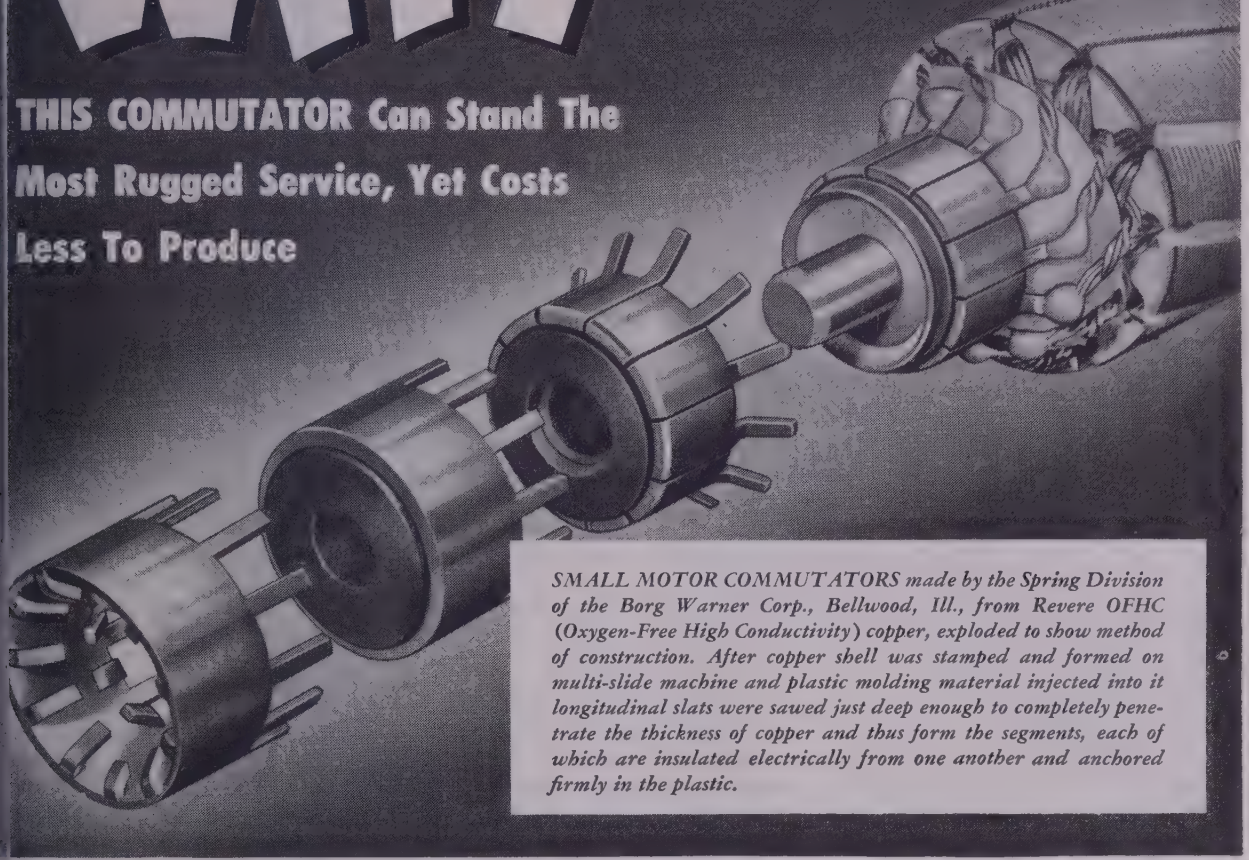

SMALL MOTOR COMMUTATORS made by the Spring Division of the Borg Warner Corp., Bellwood, Ill., from Revere OFHC (Oxygen-Free High Conductivity) copper, exploded to show method of construction. After copper shell was stamped and formed on multi-slide machine and plastic molding material injected into it longitudinal slats were sawed just deep enough to completely penetrate the thickness of copper and thus form the segments, each of which are insulated electrically from one another and anchored firmly in the plastic.

.Tvas quite a complex problem the Spring Division of g Warner Corp. dropped into the lap of Revere's e nical Advisory Service. They were getting set to manu- re commutators for small motors and they wanted lect the best material for the job.

ere were the specifications: The material had to be the est possible yet still able to take the extremely severe ing operation which was to be done in a multi-slide hine. High hardness was necessary in order to com- maximum wear resistance with the ability to with- l the extreme centrifugal force developed in small ors operating at high speeds. In addition, in the mold- peration, which is done after the copper shells have formed, it was necessary to hold the diameter of the to within .001″ in order to prevent the plastic from ng between the mold and the outer surfaces of the nutator. An equal tolerance was also imposed upon the ht of the solid cylindrical portion for the same reason. of great importance was the need for the cylinder wall g almost absolutely flat.

Cause of long experience with somewhat similar prob- Revere recommended trial of OFHC (Oxygen-Free Conductivity) copper, four numbers hard. This was d along with several other metals. The OFHC alone found to produce excellent parts, and with tolerances ose as to be almost unbelievable in this type of opera- All other types of copper failed at the very sharp bend e the anchoring lugs join the side of the shell.

A unusual feature of these commutators is the plastic rial used in the core. Tough, and unusual in composi- it serves both as insulation and as a mechanical connection between commutator and shaft without use of a bushing and key.

To determine if these commutators could *really* take it, test motors in which they were used were speeded up to 35,000 rpm. Although the wiring in the rotors practically exploded at that speed, there were no failures in the commutators, Temperature tests up to 400° F. were also made. Here again there was no damage to the commutator, though the rotor wiring was badly damaged due to the combination of centrifugal force and decrease in wire strength. Once again the unusual combination of properties of Revere OFHC copper had played a part in helping another one of the country's leading manufacturers produce an outstanding product at less cost.

Perhaps this or some other Revere Metal can be of help in improving your product—cutting your production costs. Toward that end we suggest that you get in touch with your nearest Revere Sales Office.

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TABLE II

VISUAL OBSERVATION OF CHEMICALLY TREATED ALUMINUM

Alloy Treated	Phosphoric Acid-Water	Phosphoric Acid-Water-Acetic Acid	Phosphoric Acid-Water-Nitric Acid	Phosphoric Acid-Water-Acetic Acid-Nitric Acid
2S 1/2H	Brightening to some polishing in 3 minutes	Slight brightening in 3 minutes	Brightening to polishing in 3 minutes	Brightening to polishing in 3 minutes
24 ST3	Etched throughout 3 minute cycle	Brightened in 15 seconds but etched thereafter to 3 minute time	Brightened for 30 seconds but uneven attack with milky deposit for 1 to 3 minute cycles	Brightening changing to ing in 3 minute range
52S 1/2H	Etched throughout 3 minute cycle	Brightened at 15 seconds and etched thereafter to 3 minutes	Brightening to polishing in 3 minutes	Brightening to polishing in minutes

(Tests conducted in Enthone Co. Laboratories)

good exhaust ventilation must be provided. Depending on the temperature of operation of the bath, parts may be supported on racks, or basket handling methods may be used.

Characteristics of Polished Surfaces—Color appearance of a properly chemically polished aluminum surface resembles that of a bright chromium plate, as is illustrated by the treated parts shown in Fig. 3. Physical appearance, however, may vary widely depending on the original conditions of the surface, the alloy, and the operating conditions used in the treatment. Chemical polishing occurs with the dissolution of aluminum ranging from 0.0002 to 0.001-inch of surface thickness. Thus, such methods of treatment do not flow the metal as in mechanical polishing; as a result, deep mechanical abrasions are not removed.

These characteristics suggest one application of the process, namely, in finishing procedures where the cost picture allows prior work. Mechanical buffing is used for the first operation, thereby eliminating all deep scratches and imperfections, and the chemical polishing follows for the finishing step, leaving the surface with a clear brilliance. However, where a finishing procedure is desired, either because of cost considerations or because of unusual contours, making buffing impossible in many instances, it has been found[1] that a chemical polishing process will give a very attractive surface on the regular mill finished material.

Since the resistance to corrosion of the highly finished aluminum parts leaving the chemical polishing bath is about the same as the original stock, very little passivity being imparted by the treatment, it may be in order to consider subsequent methods of treatment which will add to the corrosion resistance of the articles. Following the brightening treatment, the parts may be rinsed thoroughly and anodized. Shorter anodizing cycles than are normal may be used to give corrosion resistance and yet not hide the brilliance of the original finish. The anodized part may be sealed and used as is, or it may be dyed to give extremely rich color effects.

A second method of finishing the highly polished surface is based on the use of organic films. A temporary coating of this type useful for cheap articles are so called water-shedding lacquers; in addition, their use assists in obtaining waterspot-free drying. However, a baked lacquer has been found to be much more durable and is generally considered for more expensive articles where provisions are made for drying and spraying.

Miscellaneous Chemical Treatments—Recent publications of Reynolds Metals Co.[3] have presented details on several processes for chemical treatment of aluminum surfaces, some of which may impart special properties.

Modified Bauer-Vogel Process—It has been reported that this process is of considerable commercial importance in the foreign field for the production of a protective oxide film on aluminum and aluminum alloys free of copper. The treatment involves immersion of the work in an aqueous solution of 5 per cent sodium carbonate and 1.5 per cent sodium chromate at 195-212° F for 3-5 minutes, then rinsing in water. The surface film formed (reportedly a slate gray in color) has been described as possessing fair adhesion and abrasion resistance. This treatment has been used as a base for painting and coloring. The hardness and corrosion resistance of the film can be increased by immersion in a 3-5 per cent sodium silicate solution, at about 195° F for 15 minutes.

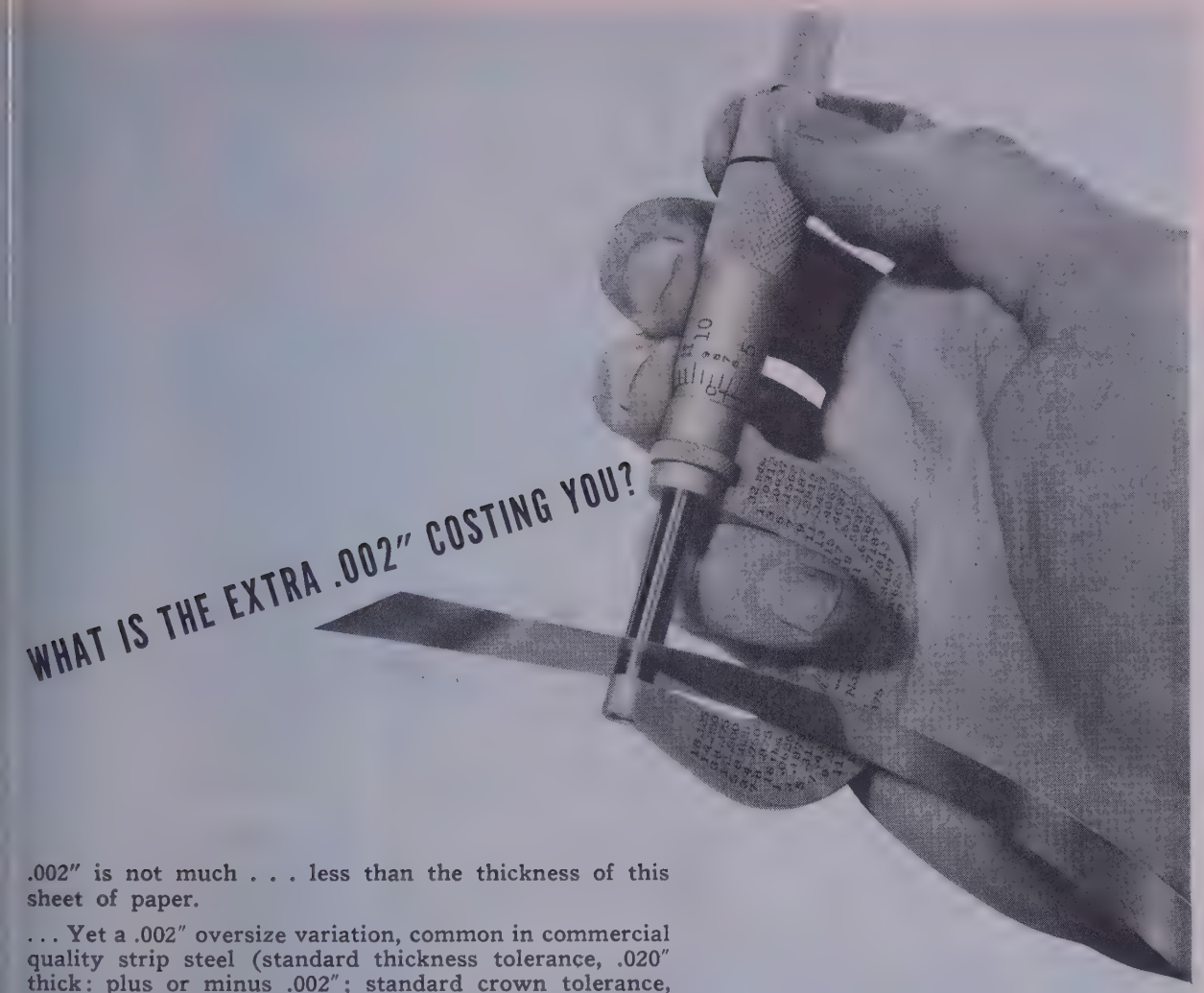
Protal Process — This treatment consists of immersing aluminum for about 40 minutes in boiling solution of 0.5 per cent alkali manganate, molybdate or vanadate, and 1 per cent sodium hydroxide or carbonate. It is reported that the alkaline solution produces metallic compounds which form two oxides, a higher one which is soluble in alkali, and a lower insoluble. This occurs under the reducing action of hydrogen liberated at the aluminum surface. The lower oxide is deposited in the aluminum oxide film, forming what is described as an adherent protective oxide film on the metal.

Pacz Process—This process c the treatment of aluminum in (160-212° F) solution consistir about 0.15 per cent sodium flu cate, sodium oxalate, or sodium zirconate, 0.25 per cent nickel c balt salts, 0.3 per cent sodiu ammonium nitrate, to yield a pr tive, colored, abrasion-resistant The variation in color tone in tain areas is said to result fro weak etching action of the so fluosilicate, etc., which dissolves minum. Darker areas result fro aluminum alloy constituents, su iron or silicon, which are no tacked.

McCullock Process—A white tective film is said to be forme commercially pure aluminum, greenish-white film is formed or minum alloys, by immersion hot (160-212° F) solution of cent calcium hydroxide and 1 cent calcium sulphate for abo hour. The calcium sulphate is to reduce the alkalinity of the it has been reported that corres ing strontium compounds pr films equally as good. After ment in the solution, until the evolution of hydrogen subsides metal is washed and heated to 390° F. This reportedly evapo the water present in the film is said to be composed of ca and aluminum sulphate and a num oxide, and increases its trical resistance. One report that if aluminum is treated in bath of 0.5 per cent barium oxid 0.5 per cent barium sulphate, un silvery-gray adherent and prote films are formed on the metal

Chromatizing—This treatmen volves the treatment of aluminu chromic acid solution to form a thin, inert aluminum oxide fil the metal surface which serv promote paint adhesion. One that has been recommended is 10 per cent solution of chromic maintained at a temperature of 150° F. Work is left in the sol for about 5 minutes, after whi is rinsed in cold water and drie

Frosted Finish for Alumin Frosted finishes produced on a num by chemical treatments ha



.002" is not much . . . less than the thickness of this sheet of paper.

. . . Yet a .002" oversize variation, common in commercial quality strip steel (standard thickness tolerance, .020" thick: plus or minus .002"; standard crown tolerance, over 12" wide: plus .002") adds 1⅓ ounces to the weight of a square foot of .020" strip, increasing the weight from 13⅓ ounces to 14⅔ ounces.

This means you lose 219 square feet on every ton of .020" strip steel which runs a permissible .002" oversize.

. . . The wear on fabricating dies sized to handle .020" strip is obvious. Often the number of units produced per die grind is reduced 15% or more.

You can avoid much of this loss by using CMP THINSTEEL. With a plus or minus thickness tolerance often ½ or less of commercial tolerances, "yield" per ton can be increased as much as 10% or more while tool life increases of 10% to 15% are common.

In addition, you can reduce machine shutdown and change-over time by ordering CMP THINSTEEL in extra-long coils—up to 300 pounds per inch of width.

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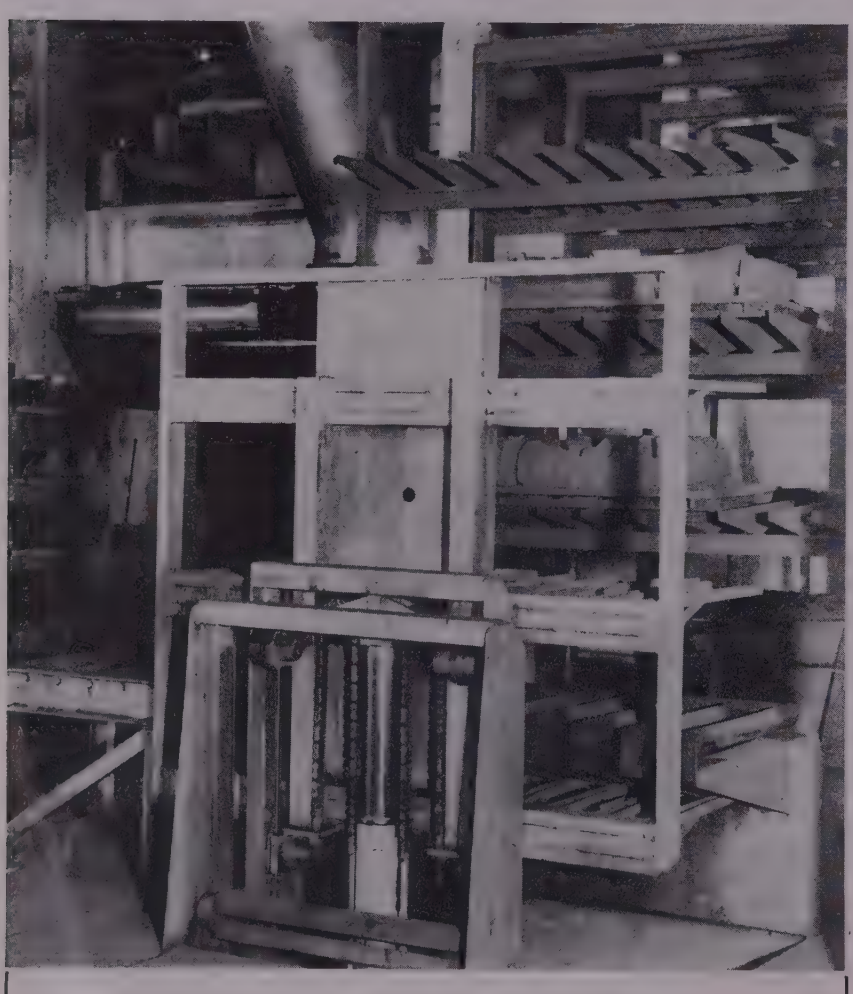
attractive silvery appearance much like that of finely etched glass. The method is useful for finishing small or intricately shaped articles not adapted to machine methods. However, in many instances subsequent finishing treatments are required to make the finish more permanent.

According to recommendations[5] of Aluminum Co. of America, the first step in the frosting of aluminum is to etch in a hot caustic soda solution. This operation may be carried out in a wide range of conditions depending on the gage of the metal and the finish required. Immersion for 1 minute in a 15 per cent sodium hydroxide solution at 160-180° F is frequently used, although the concentration may vary from 2-25 per cent, and the bath is sometimes heated to boiling. It has been reported that the etching process is greatly accelerated at the boiling temperature, but the caustic may dry in streaks, causing stains.

To overcome this difficulty some manufacturers use a 5 per cent caustic soda solution, followed immediately by immersion in a 2 per cent solution. The second solution is too weak to attack the surface of the aluminum in a short time, and therefore eliminates to some degree the problem of staining. If the time between etching and rinsing is kept at a minimum, the danger of staining is minimized. Also, there is less risk of discoloration when cold water instead of hot water is used for rinsing.

Third step in the process is to immerse in strong nitric acid to neutralize any sodium hydroxide left on the surface. A solution that has been recommended is made by mixi to two parts of concentrated acid with one part of wate part of the process remov colored film left on the surf the caustic solution and leav metal with a clean frosted Following this, the parts are in clear, cold water and finally

When aluminum alloys whic tain substantial amounts of are to be frosted, it is necess add hydrofluoric acid to the acid. One part of concentrated fluoric acid to four-eight pa concentrated nitric acid is a tion that has been successfully It is important that this aci ture be used cold; if it becom during use, a yellow coating produced that is difficult to r



GIVES CORES A LIFT: A 50 per cent increase in production is a result of installation of a hydraulic lift for transferring cores to and from oven conveyor racks in the Charles City, Iowa foundry of Oliver Corp. It is used in conjunction with two conveyorized core baking ovens with insulated cooling chambers, made by Despatch Oven Co., Minneapolis. Loader lifts and deposits three separate loads from the roller conveyor onto the three levels of the oven rack. Unloading is performed in a similar manner at the end of the oven cooling zone, the cores not being handled until the assembly operation.

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COMPLETELY self-contained portable, a packaged dry gr system made by Hardinge Co York, Pa., needs but a single connection to be put into ope Unit will be exhibited at the Exposition of Chemical Indu in New York, Nov. 28 to Decem

Measuring 5 x 7½ feet and high, the packaged system in a constant-weight feeder susp from a 3 cu ft feed bin, a c mill with drive motor, air class system with loop classifier, c product collector, exhaust fa piping, bag-type dust collecto "electric ear" sound control uni

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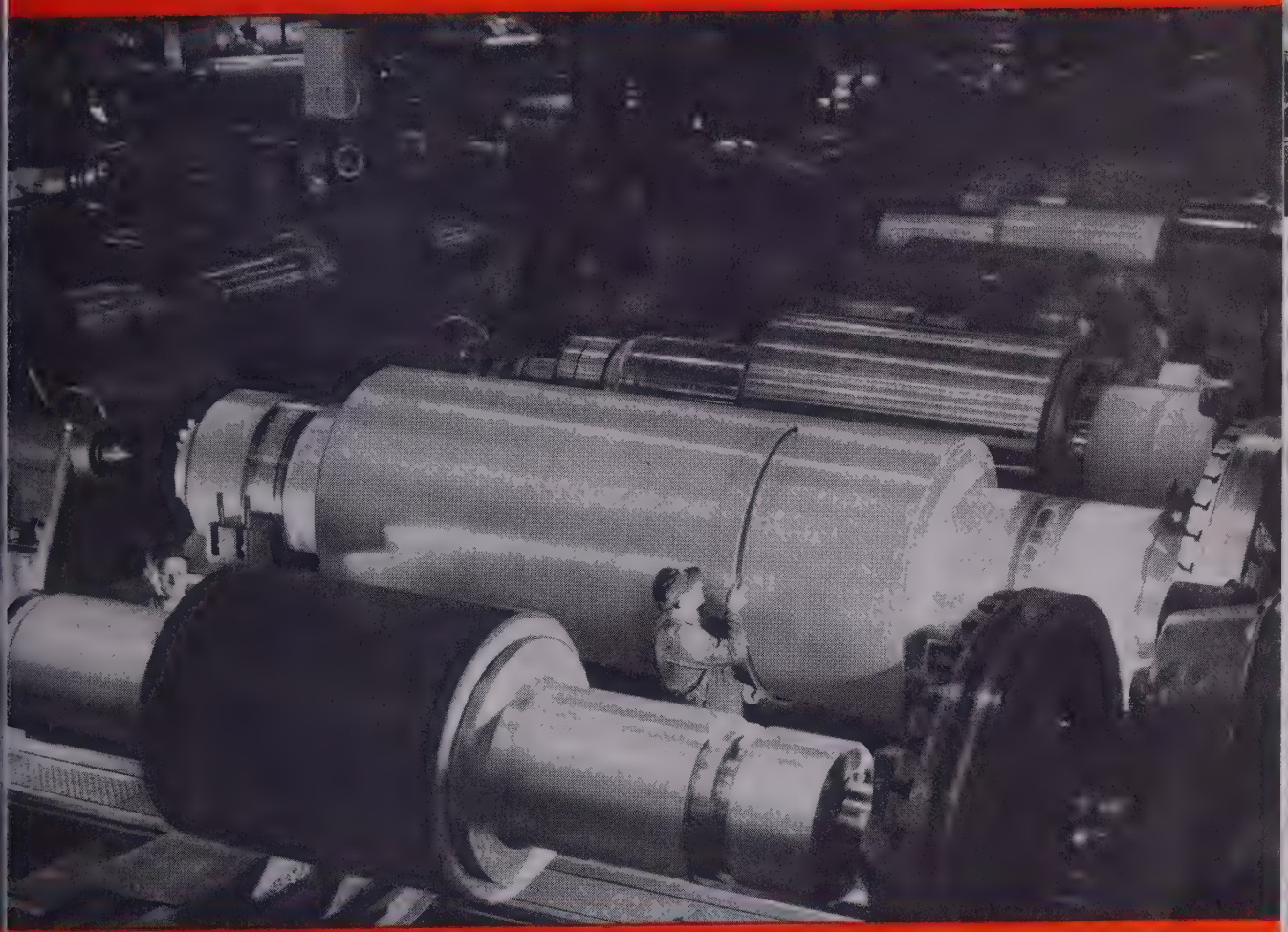
INCLUDED in the 18th annua tion of the *Metal Finishing* book-directory are articles on v phases of such subjects as fin plant engineering, abrasive me cleaning, pickling and electro ing, plating solutions, surface ments and control and testing.

In addition to the more th articles there are sections devo first aid procedures, a directo product classifications, a list of names and list of consultants, s teaching electroplating, engin societies and reference books. lisher is Finishing Publications New York.

MESTA ROLLS



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DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY · PITTSBURGH, PA.

The author received his A. B. degree in chemistry from Cornell University in 1909. For a year following graduation he was employed as a chemist at the Stanley Works, New Britain, Conn. In the latter part of 1910, he became associated with Carpenter Steel Co., as assistant to the metallurgist. In 1915 he was appointed metallurgist and in 1941 became chief metallurgist in charge of the research department. Four years later, he was appointed vice president and technical director as well as a director of the corporation, which positions he holds today.

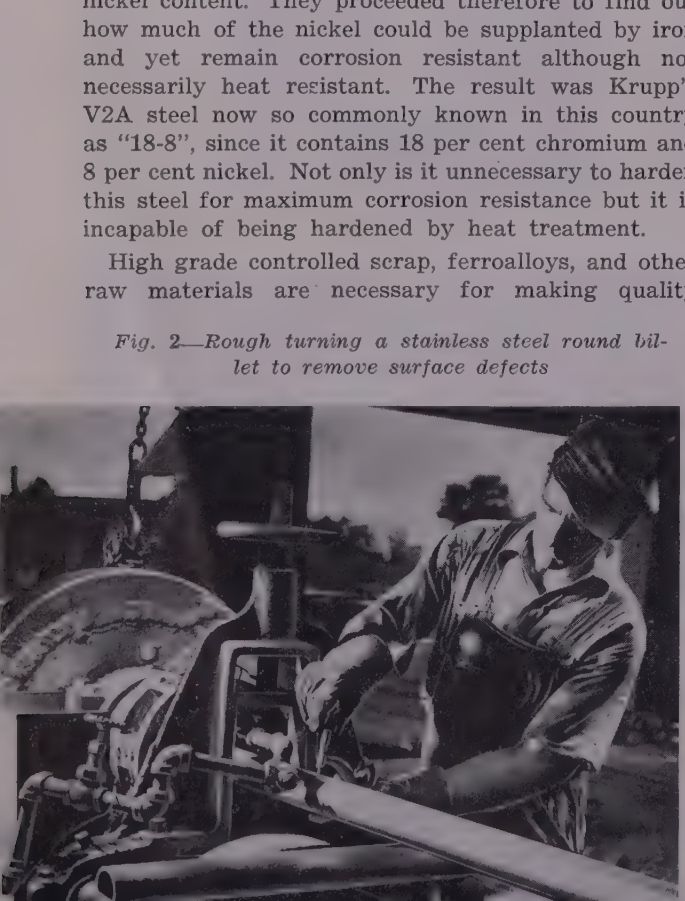
His technical connections include membership in the American Iron & Steel Institute, Iron & Steel Institute of Great Britain, American Association for the Advancement of Science, American Society for Testing Material and the American Chemical Society.

The basic patents of free-machining stainless steels were developed under his direction. From 1942 to 1948 he served as chairman of the Stainless Technical Committee of the American Iron & Steel Institute, of which committee he is still a member.

Perhaps simultaneously with Brearley's discovery was that of Benno Strauss and Edward Maurer working at the Krupp works, Essen, Germany. These two scientists were initially interested in heat resistant metals composed primarily of nickel and chromium. The corrosion resistance of these alloys was early appreciated but so was their high cost, owing to high nickel content. They proceeded therefore to find out how much of the nickel could be supplanted by iron and yet remain corrosion resistant although not necessarily heat resistant. The result was Krupp's V2A steel now so commonly known in this country as "18-8", since it contains 18 per cent chromium and 8 per cent nickel. Not only is it unnecessary to harden this steel for maximum corrosion resistance but it is incapable of being hardened by heat treatment.

High grade controlled scrap, ferroalloys, and other raw materials are necessary for making quality

Fig. 2—Rough turning a stainless steel round billet to remove surface defects



PRODUCTION OF STAINLESS STE

stainless steel. Melting conditions such as atm pheres, and slags, (oxidizing and reducing), toge with temperature must be readily controlled these stringent requirements make the electric furnace methods of melting mandatory excep when high grade stainless scrap, free of impuritie available in which case induction furnace meltin practiced.

In the manufacture of stainless steel ingots, wh are later to be rolled or hammered into commer forms, the so-called "basic" arc furnace is most erally used. This furnace has a magnesite bot permitting the use of highly basic lime slags for fining. In the manufacture of stainless steel casti on the other hand, the "acid" furnace is quite versally used. In this furnace the bottom is m up of silica brick or sand, permitting the use of cous slags which have the advantage of easy hand in the foundry. These furnaces vary in size or pacity from even smaller than one ton to as large one hundred tons although by far the greatest nage of stainless steels is melted in basic electric furnaces of around 10 to 50-ton capacity. In more common basic electric arc practice, the b charge of unalloyed scrap steel is melted and oxidi by means of ore which removes the principal impur carbon, and in this process excess silicon, mangan chromium, and aluminum are also oxidized if p ent. These oxidizable elements will be taken by the slag. After the carbon is low enough, oxidizing slag is run off and a second slag, reduc or refining in nature, is made up on the surface the molten bath of metal by adding crushed li and ferrosilicon together with fluorspar to prom proper fluidity. The bath is refined under this stro ly deoxidizing and desulphurizing slag. Alloy elements such as ferrochromium, ferrocolumbium ferromolybdenum are then added to the bath. A of the alloying elements such as nickel are not rea oxidized or lost to the first slag and these are quently added to the charge during the initial m down.

Several special methods for the melting of st less steel have been developed which permit the of chrome ore and a large percentage of stainl scrap, to replace in large part the use of low car ferrochromium. Specially constructed arc furna usually lined with chromite or chrome ore, are so times employed. In general these processes c sist in melting down under highly oxidizing conditi a charge high in chromium content. Carbon is t removed, but in so doing much of the chromium oxidized into the slag, so that this must again reduced into the bath by heavy additions of a oxidizer, usually ferrosilicon. Necessary fluxing m terials such as lime and spar must be added to p duce a manageable slag. One of these special pr esses which has come into use recently consists melting down a charge of stainless steel scrap, at the proper time bubbling oxygen through the b to boil out the carbon. When carbon has been moved, the chromium is reduced from the slag in

manner already described. Recovery of about 80 to 90 per cent of chromium has been reported with this practice.

Procedure to be followed in melting stainless steel in the basic electric furnace will, as we see, vary considerably from plant to plant and of course from one kind of stainless to another. The following is a brief outline of one way, for example, that a 12-ton heat of chrome-nickel stainless may be melted. About 6,000 pounds of steel plate containing approximately 0.20 per cent carbon together with the desired amount of nickel in the form of electrolytic nickel plate and molybdenum in the form of ferromolybdenum is melted down under the arcs of three carbon or graphite electrodes. Approximately 800 pounds of iron ore (Fe_2O_3) is next added to oxidize carbon and form a boil resulting from the formation and evolution of carbon monoxide gas. A sample taken for analysis at this point shows the bath to contain about 0.02 per cent C, 0.05 per cent Mn, 0.10 per cent Si, 0.05 per cent Cr, and residuals plus added amounts of the not easily oxidizable metals, such as nickel, copper, and molybdenum. The oxidizing slag containing the oxides of the various metals is then taken off. A new slag is made up from lime, fluorspar, and ferrosilicon. This reducing or refining slag removes much of the sulphur and reduces many of the oxides present in the bath. All of the chromium, approximately 6000 pounds, is next added in the form of low carbon-ferrochrome. The bath is again analyzed for carbon, silicon and manganese, and finally the heat is adjusted for tapping, both as regards temperature and analysis and tapped.

Fig. 3—Rolling stainless steel rounds on a 20-inch two-high mill

The high frequency induction furnace affords a convenient means of melting stainless steel from charges containing high percentages of stainless steel scrap, since in this process there are practically no alloy losses. It is for this reason that the raw material, namely scrap, must be free of harmful impurities. The process is primarily one of melting scrap, making necessary additions to meet desired analysis, adjusting pouring temperature, deoxidizing and then pouring. Although slags are not generally used in induction melting, there are numerous instances where special treatments and special slags are employed to improve properties of the material. In the induction furnace most generally used for

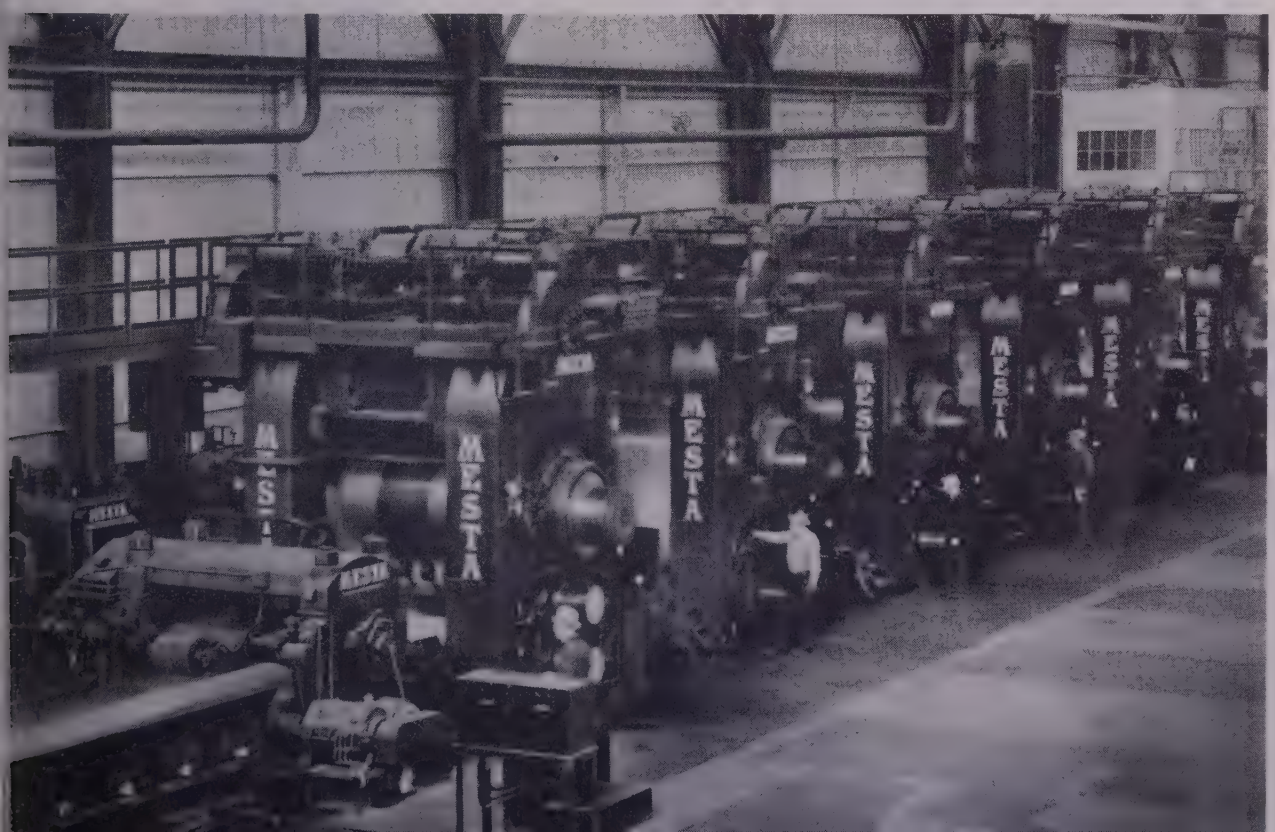


Fig. 4—Stainless strip and sheet is rolled on modern continuous hot mills such as this massive unit

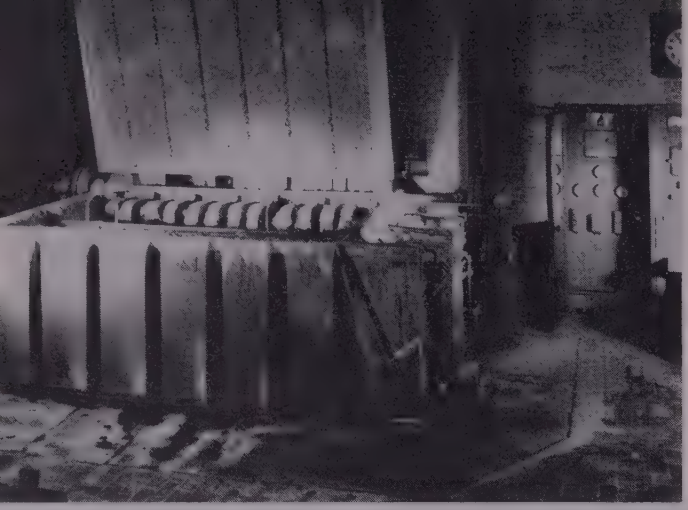
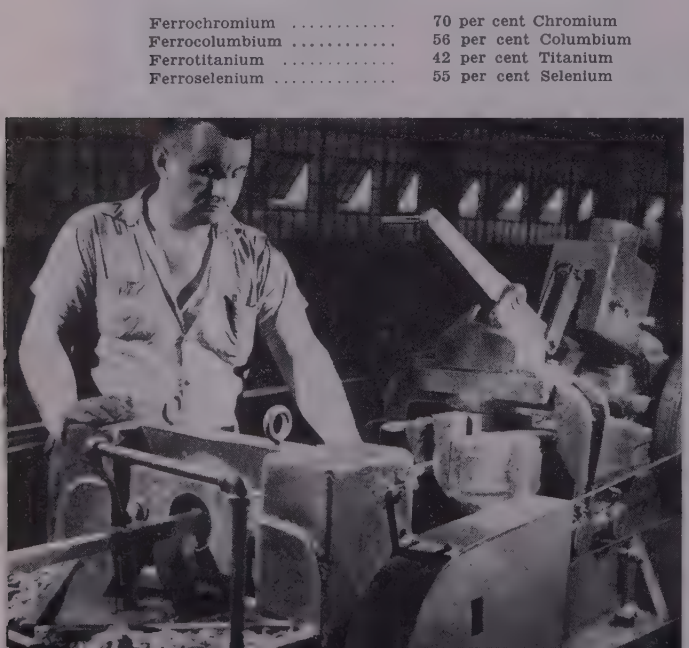


Fig. 5—Sodium hydride pickling bath and instrument control panel

melting, a frequency of about 980 cycles per second is employed. This frequency best meets the requirements for rapid heating throughout the charge. Furnaces range in capacity from a few hundred pounds up to several tons or even larger. The time required to melt depends on capacity of the electrical equipment, but 1 hour for a ½-ton melt in a 300 kilowatt furnace would be typical. One procedure that might be followed in melting a heat of chrome-nickel stainless steel would be as follows: Up to as much as 90 per cent of stainless scrap is added to the furnace. This may be either a chrome-nickel type or any other stainless which would fall within the desired analysis limits. After melt down, an adjustment to the analysis is made. Ferrosilicon is then added to deoxidize the metal before the addition of chromium in the form of low carbon-ferrochrome is made to the melt. Ferroalloys such as ferromolybdenum, ferrocolumbium, ferrosilicon, etc., as required by the analysis are added next, followed by deoxidization of the heat with calcium silicide or aluminum. Finally, the heat is poured through a refractory ceramic dish into the mold.

The following alloys and ferroalloys are commonly used in melting stainless steels; the balance of the analysis is, for the most part, iron:

Ferrochromium	70 per cent Chromium
Ferrocolumbium	56 per cent Columbium
Ferrotitanium	42 per cent Titanium
Ferroselenium	55 per cent Selenium



PRODUCTION OF STAINLESS STE

Ferromolybdenum	61 per cent Molybdenum
Ferrotungsten	80 per cent Tungsten
Cathode Nickel	99 per cent Nickel
Nickel Oxide	75 per cent Nickel
Iron Sulphide	35 per cent Sulphur
Nitrogen Ferrochromium	70 per cent Chromium
Electrolytic Copper	100 per cent Copper

Usually the ingot sizes for stainless steels fo those conventionally used for other steels. Molds of the big-end-up type on top of which is place brick refractory called the hot top which by kee a reservoir of molten metal to feed the center of ingot as it freezes, prevents shrinkage cavities. gots may be removed from the molds and place a soaking pit prior to hot working by rolling or h mering or they may be cooled to room tempera and then reheated prior to hot working. When s ing pits are used, control must be exercised the temperature employed. If soaking pits are used proper precautions are taken in cooling the gots prior to reheating.

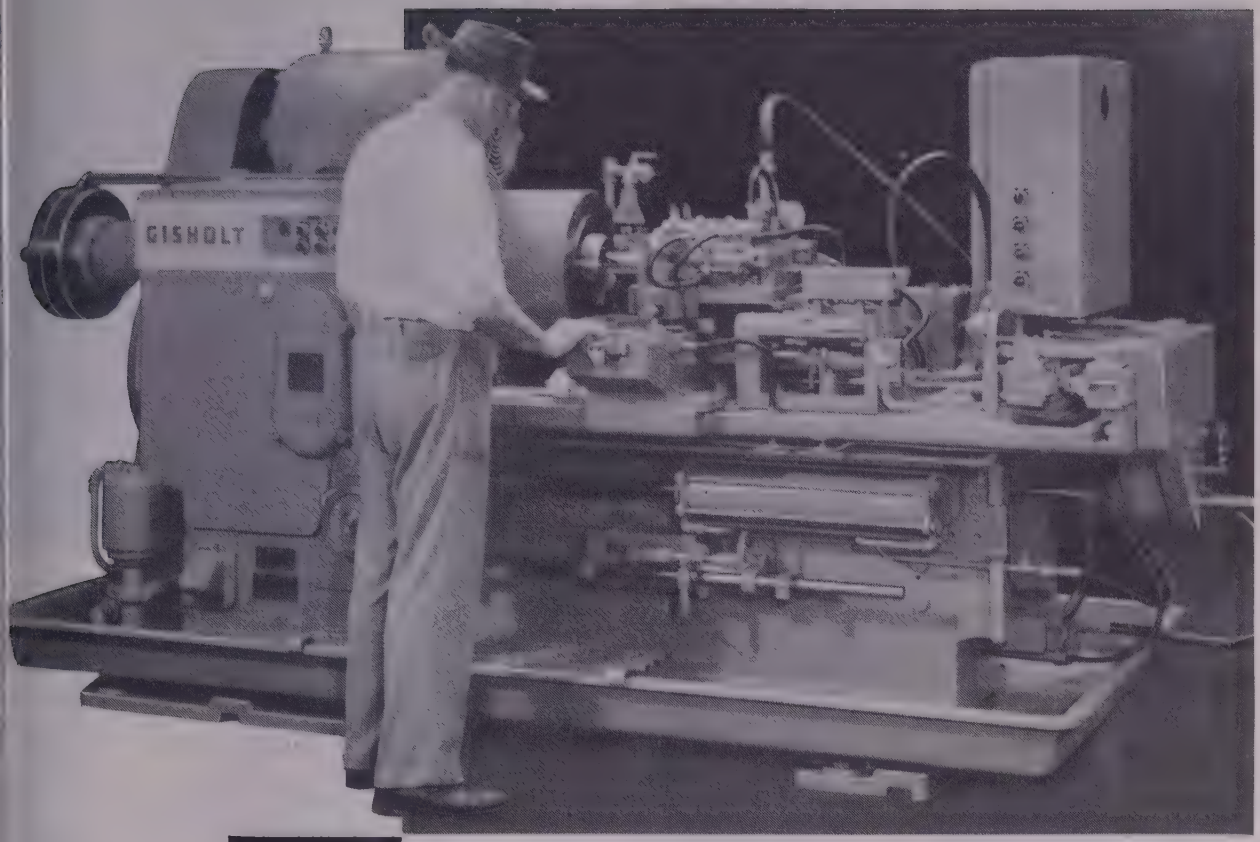
In heating ingots for cogging into billets, care m be exercised to prevent too great a temperature ference between the ingot's surface and center. St less ingots must be brought to temperature m slowly and allowed to stay at temperature longer cause of their lower heat conductivity which is about one third as great as for ordinary steel. heated fast the outside of the ingot may become hot and expand more rapidly than the inside the result that the metal may tear apart formin defect known as a "clink". These may be avo by slow heating and by preheating. The exact cedure employed depends on the type of steel and of ingots. When preheating is practiced the temp ture recommended depends upon the individual position. When preheating is not practical the i should be charged in a cold furnace, and brou up gradually with the furnace. After the ingo up to temperature it should be held for a lengt time depending upon size. The average time of h ing a 10 inch ingot is about 5 hours.

Heating furnaces are generally fired with low phur oil or natural gas, and a slightly oxidi atmosphere is maintained which helps produce a scaling oxide. The initial hot working tempera for practically all stainless steels is around 2100

Generally the ingots are first worked by roll hammering or pressing to a billet, slab or bloom a which they are prepared to produce a clean surf Hammering of an ingot is shown in Fig. 1. The bi are rolled on conventional mills but because stain steels are harder at red heat the reductions for pass through the mill are smaller.

Stainless steels, especially, must have surfaces of defects to improve appearance, decrease corro and increase strength. Several methods are use prepare the billet surfaces prior to rolling to

Fig. 6—Drawing square stainless steel bar throug die on drawing bench. Steel is drawn to produc accurate size, increased strength and desired shap and surface



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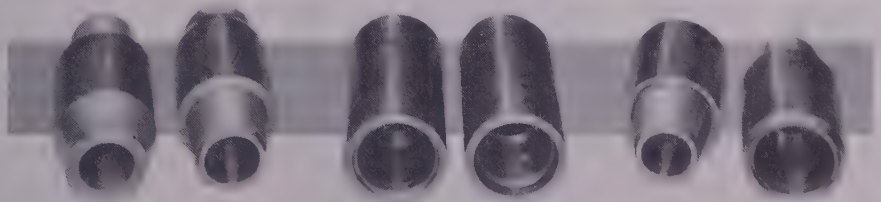

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Fig. 7—Drawing stainless steel into round wi Material was previously hot rolled, cleaned a limed rod which first passed through grease soap and then through die to be eventually coile up by mechanically driven block

Rough turning, chipping and grinding are the most common.

Rough turning is generally limited to round billets —the process being similar to turning on a lathe excepting that instead of the billet turning and the tool remaining stationary, the tools, usually six or eight in number mounted in a ring revolve about the perimeter of the billet. This process is shown in Fig. 2. Rough turning is the least demanding on human labor.

Grinding is best adapted to flat surfaces such as square billets. Surfaces may be ground all over or in spots depending on condition of the billets. Grinding wheels are on the average about 24 inches in diameter and turn about 1500 revolutions per minute. The wheel is swung back and forth from a frame by the operator.

Chipping is carried out using pneumatic chisels. Defects, such as seams, which are usually elongated are marked with a crayon and an operator then removes the defect such as chips of wood are gouged with a gouging tool.

Frequently several of the above methods are used in combination, such as "grind-pickle-and chip". The billet is first ground all over, then cleaned or pickled in hot acid to reveal any local defects too deep to be removed by the grinding and these defects are then chipped out. All surface preparation procedures are costly but indispensable to quality steels.

Stainless steels are, with few exceptions, furnished in the form of plates, sheets, strip, bars, tube rounds, structural and bar shapes, round and flat wire rod and tubing. In producing these products the prepared billets are reheated and rolled on conventional mills as shown in Figs. 3 and 4.

The following illustrates briefly the basic steps of one method of processing a 10-inch stainless ingot to 1-inch round bars. The method will vary with other types of steel.

Bloom down 10-inch ingot to billet approximately 4-inches square or round which is rough turned if round, or ground and chipped if square. Common practice is to first grind, then pickle to expose further defects and then chip. Cut billet to proper lengths to provide 10 to 14 feet bars, and then billets direct to 1-inch rounds.

Following hot rolling the steel if hard mus annealed or softened to place it in the best cond for the cold forming operations which consist m of drawing into wire or rolling into strip or s

Methods of annealing vary widely. Generally chrome-nickel types are quenched into water a yellow heat, 1850 to 2100° F. This treatment only softens but places the steel in the best c tion to resist corrosion. Chromium stainless s are annealed at a lower temperature, 1550 to 165 and are generally slow cooled in the furnace. lower temperatures, 1200 to 1400° F, are use chromium steels if only requirement is to re stresses and hardness imparted by cold working.

Complex oxides of chromium, iron and ni mainly, are formed on the surface of the steel ing heating and hot rolling. This coating is kn as "scale". Most heating scale falls off during rolling and this often has a beneficial effect in surface defects and decarburized metal is scaled a Scale which remains after hot rolling is comp must be removed if further cold reductions ar be made because it is very abrasive and would sc drawing dies and rolls. Generally the oxide i moved by pickling, i.e., immersion in hot dilute drochloric acid or mixtures of nitric and hydrofl acids. These acids are more active than the v dilute sulphuric acid used on most alloy s Pickling generally takes from 10 to 30 minutes which all traces of acid are removed with a pressure stream of water. The rod may or may then be coated with lime and baked at about 25 depending on the type of ensuing cold deforma Baking serves two purposes—it dries the lime ma it more adherent and drives off any hydrogen w may have been absorbed by the steel during it journ in the pickling bath because hydrogen t

embrittle certain steels. Pickling is necessary only after completion of hot rolling but after h process anneal in which scale is formed.

cid treatments are not used for cleaning alone— y are also used for brightening the surface to give nore pleasing appearance. In addition, stainless ls are frequently "passivated" or "immunized" by nersing in an oxidizing acid such as nitric. The ecularly thin film of oxide formed by this treatnt improves corrosion resistance of the steel. The sivating treatment is the final acid treatment that metal receives and consequently is also relied n to dissolve any foreign particles of steel which ht have clung to the stainless and would have reased its corrosion resistance.

ne of the newer and highly successful methods descaling stainless steel is the sodium hydride cess. This is performed using a molten bath of ium hydroxide at about 700° F. At one end of bath there is a compartment into which metallic ks of sodium are introduced. Hydrogen from disated ammonia is then passed over the sodium and ium hydride formed which is dissolved by the bath his manner to the extent of 1.5 to 2.0 per cent ium hydride. The sodium hydride reduces the e by chemical reaction. The reduced scale or al is so loosely held that it falls off when the l is quenched from the hot caustic into cold water.

he bath and instrument control panel are shown ig. 5. After descaling by sodium hydride, stain- steels may be dipped briefly in dilute acids to hten or passivate the surface.

nother process for treating the surface of stain- steels is known as electrolytic polishing. Here stainless article is made the anode in a suitable l solution and by passing current, a small amount he stainless is dissolved and the surface becomes bright as though it had been buffed. One of the t popular acid mixtures used as an electrolytic shing solution is glycolic, phosphoric and sulric acids, used at approximately 8 volts and at ° F for 2 minutes. Other popular solutions con- of citric-sulphuric acid or sulphuric-phosphoric l mixtures.

is economically feasible to hot roll steel only

ig. 8—Centerless grinding stainless wire to remove surface defects and produce accurate size and pleasing finish

PRODUCTION OF STAINLESS STEEL

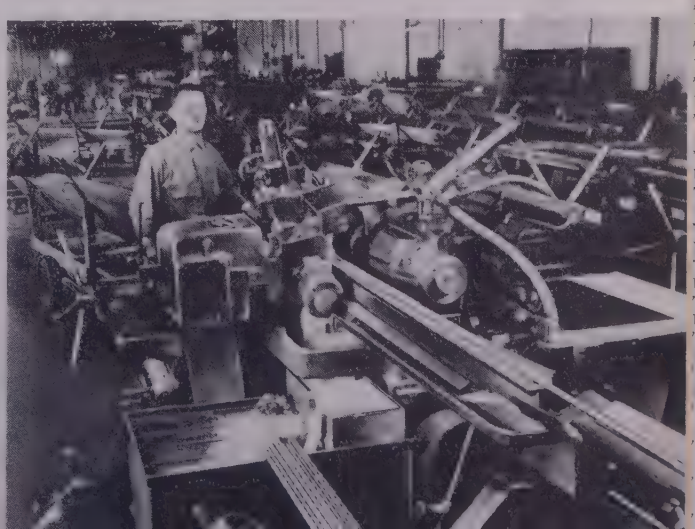
to certain minimum sizes. For example, in rolling rounds, No. 5 rod, 0.220-inch diameter is about the smallest. On sizes smaller than this the metal lacks sufficient rigidity to be handled hot at high speeds. To produce smaller sizes it is necessary to work the metal cold as by wire drawing or cold rolling. These cold processes are used not only to produce smaller sizes but also to develop higher physical properties, closer tolerances and better finishes than are obtainable by hot rolling.

In wire drawing, the steel is first pickled or cleaned and then coated with a heavy layer of lime by dipping the coil or bar into a hot lime water suspension. The lime then dries on the surface of the metal to act as a lubricant and aid in holding other lubricants such as grease or alkaline soap powder, through which the metal passes immediately before being pulled through the die. Drawing stainless steel on a bench, for straight lengths, and a block, for coils, is shown in Figs. 6 and 7 respectively. Mainly because of the galling action, even on the best dies, the percent reduction in area, without annealing, is limited to 50 to 60 per cent with chrome-nickel stainless steels unless special coatings are applied to the wire. To obtain greater reductions and consequently higher strengths the metal is frequently coated with lead or a lead-tin alloy by dipping the steel into a molten bath. In still other instances, the wire is electrolytically coated with copper, to aid formability either in the mill or fabricating plant. Wire drawing dies used on stainless differ slightly in design from those used on ordinary steels because of the greater amount of heat generated. Speed with which the stainless is pulled through die is slower than usual.

To produce a perfect surface on round rods or wire, coils are straightened and cut to length and then passed through centerless grinders one or more passes as shown in Fig. 8.

Mills used for cold rolling stainless must be solidly built due to their greater stiffness as compared with alloy steels. No lubricants need be applied to the metal during cold rolling but oils are used occasionally. It is not necessary to anneal as frequently in cold rolling as in drawing because unlike a stationary drawing die, revolving rolls do not invite galling.

(To be continued)



Age-Hardening Alloy

(*Concluded from Page* 49)

should be ordered to be of high purity welding grade.

Atomic Hydrogen Welding — This welding process works well on the material of suitable thickness 0.025 to 0.093-inch; welds are smooth and sound. On many jobs the inert gas metal arc process is preferred over atomic hydrogen due to the much smaller heated area and subsequent distortion. When using the atomic hydrogen processes care must be exercised to avoid overheating the weld puddle surface.

Oxyacetylene welding requires some additional development work. Sufficient weld tests have been made to indicate proper fluxes are not as yet available for use with this alloy.

Resistance Seam Welding — Some spot welding of the metal to itself has been done successfully in several shops. No unusual difficulties have been reported. Since the electrical resistance is high (740 ohms per cir. mil foot), the current used is relatively low. Relatively higher pressures than used for steel are required to produce adequate forging during nugget solidification. Cracking will not occur if the unit pressure is high (40,000 psi) or if pulses of post heating current are employed to reduce the unit stress by spreading the heat over a larger area.

Small amount of work done in spot or seam welding the alloy to other materials has not been too successful. It is difficult to obtain a conventional nugget without excessive surface burning, porosity, and expulsion. It is possible to obtain a "braze type weld" (nugget entirely contained within the sheet) rather easily.

Good butt welds have been made on the material to itself and to 4140 and 4340 ISI sheets. High unit pressures and good control of power during flashing and upset are essential.

Completes Survey on Carbon

A MARKET survey in the field of industrial carbon, including by-products, in relation to the Pacific Northwest has been completed by Ivan Block, consultant, for the United States Department of the Interior. The 87-page booklet deals with requirements for carbon as a reducing agent, and for electrodes, sources of carbon in the Pacific Northwest with notes on delivered prices and freight rates.

On the basis of current information, it seems apparent that Pacific Coast consumption of coke and coke breeze for industrial purposes is somewhere between 100,000 and 150,000 tons a year. Current consumption of petroleum coke for aluminum reduction is about 160,000 tons a year.

Copies of the report entitled "Carbon" are available from the Department of the Interior, Pacific Northwest Field Committee, 506 Failing Bldg., 618 S. W. Fifth Avenue, Portland 4, Ore.

Crane Features Flexibility

TO MEET expanding requirements of industry for bigger capacity, longer reach and higher lifts, plus the speed and flexibility of pneumatic-tire mounting, Bay City Shovels Inc., Bay City, Mich., is building a 25-ton capacity crane. Model 190-T61 CraneMobile is mounted on a three-axle crane carrier and is equipped with 10 tires and a Timken tandem rear axle unit. The model 190 CW CraneWagon is a self-propelled one-engine crane, mounted on a 6-wheel carrier equipped with 12 tires. Both have air brakes on all wheels.

New Machining Technique

PISTONS worth many thousands of dollars are being salvaged through unusual procedure in the replacement of damaged C-54 nose wheel piston cams. In this assembly the cams are attached to pistons with studs. In the original manufacture the cam and piston are drilled and tapped together and the threads in the cam are tapped and mated to the piston. As a result, position of the thread is different for each stud receptacle, making impossible tapping the replacement cam by normal procedures.

In the procedure developed by Texas Engineering & Mfg. Co. Inc., Dallas, a blank cam is laid out with a height gage and sine plate to match the particular piston on which it will be used. It is then drilled to the minor diameter of the ⅜-pipe thread with which the piston is tapped. Next the piston and cam are mated and a ⅝-18 thread tap, which cuts a shallower thread than the ⅜-pipe thread tap, is used from inside the piston to pick up the lead of the piston thread and score the inside of the holes in the cam.

Using the score as a guide, it is then easy to tap in the ⅜-pipe thread from the outside and mate it as perfectly to the thread in the piston as that of the original cam, the company states. Since the cam is a minor part of the piston assembly, the savings achieved have been significant.

LETTERS
to the Editor

Sponge Iron

I would very much appreci
reprint of the Kalling-Stalhed a
on "The Wiberg-Soderfors M
for the Manufacture of Sponge
appearing in STEEL, Sept. 19,
page 72.

H. B. Emerick
Assistant Metallurgist
Jones & Laughlin Steel Co
Aliquippa, Pa.

Request fulfilled.—The Editors

The Dolly Manufacturer

Page 87 of the Sept. 12, 19
sue of STEEL shows a photogra
a giant dolly mounted on Fire
tires. We are interested in obta
further information on the man
turer of this dolly.

F. J. Leanza
Development Engineer
New Holland Mfg. Co.
Mountville, Pa.

**Eidal Mfg. Co., Albuquerque, N. M
the manufacturer.—The Editors**

Forming Process

On page 100 of the Sept. 26
of STEEL there is an article ent
"Sheet Metal Forming Method"
scribing a new metal forming
od known as Marform. We are
much interested in this new m
and would like more detailed i
mation on the subject.

C. P. Terry
Assistant Advertising Mana
Hydraulic Press Mfg. Co.
Mt. Gilead, O.

On page 100 of the Sept. 26
sue of STEEL magazine, you
roughly outlined the "Marform
ess" of forming sheet metal. I
appreciate more information if
able.

M. Hollo
Tool Engineer
P. D. Bates Co. Ltd.
Ridgetown, Ont.

We read with interest in the
26th issue, page 100, the artic
sheet metal forming methods a
veloped by Glenn L. Martin Co
would like to get some more i
mation and will appreciate it if
will advise us to whom we sh
write.

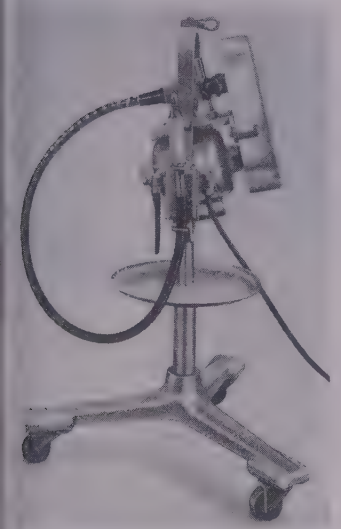
C. G. Hardwicke
Vice President
Hardwicke-Etter Co.
Sherman, Tex.

**At present we have no further details
Marform process. Method was develop
engineers of Glenn L. Martin Co., Balt
Md.—The Editors**

New Products and Equipment

ible Shaft Machine

erations such as burring, filing, ing, grinding, wire brushing and hing may be performed in many s by the series M Kellerflex flex- shaft machine offered by Pratt hitney Division, West Hartford nn. It can be mounted on stand-



floor and bench stands or sus- led. Power to the cable is trans- ed without whip.

ll fittings are standard for Pratt hitney attachments and hand- es are available in a large va- of styles, types and sizes. Unit ade with 16 constant shaft speeds, ined by manually adjusting two ps and rearranging the sheaves he jackshaft pulley. One quarter ¾-hp motors are optional.

k No. 1 on Reply Card for more Details

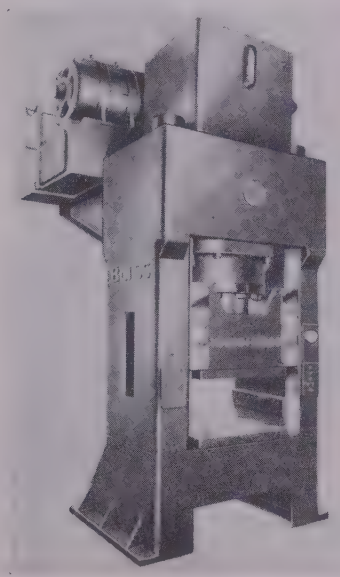
Tachometer Generator

eaturing rubber-mounted ball rings and an Alnico permanent net field which requires no sepa- excitation is the redesigned y duty direct current tachometer rator announced by General Elec- Co., Schenectady 5, N. Y. Avail- in three models, the totally en- d generator accurately measures d of steel and aluminum mill ma- ery, mine hoists, wire-forming hines, etc. The end play is pre- ed to 100 pounds to counteract end thrust of the large machines which the unit is to be mounted. utput voltage is directly propor- al to speed. Sufficient power is luced for control purposes and op- ion of an instrument simultane- y or operation of several instru- ments in parallel. Speed ranges for the three models are 100 to 1450, 100-2500 and 100-5000 rpm.

Check No. 2 on Reply Card for more Details

Single Action Hydraulic Press

Unit design of frame, cylinder and slide and use of a dual flow pumping system are incorporated in the 650-ton single action press developed by E. W. Bliss Co., 1420 Hastings St., Toledo 7, O. Simplified design of the press is intended to provide lower maintenance cost, smoother and quieter operation and increased production. Four adjustable flat type



Meehanite gibs with removable wear strips are located on uprights.

The foot valve is directly connected to cylinder and there is no interconnecting piping. The pump design permits reversing of oil flow and provides a controlled gravity descent with smooth starting and stopping as well as smooth release of pressure at the end of the pressure stroke. It is identified as the HS-650-H-36-36 press.

Check No. 3 on Reply Card for more Details

High Speed Wire Straightener

Greater capacity is designed into the type 3A Shuster wire straightener built by Mettler Machine Tool Inc., 132R Lawerence St., New Haven, Conn. Almost continuous wire travel, high speed cutoff and absolutely square ends are features of the machine which is capable of straightening from ¼ to ½-inch diameter wire (up to 9/16-inch in soft stock). Type 4A machine handles diameters from ⅜ to ⅝-inch, or up to 11/16-inch in soft stock.

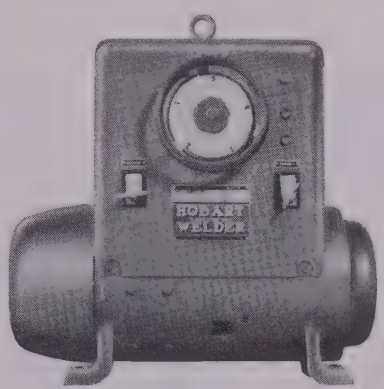
The direct driven, 5-die filer machine has a quiet V-belt motor drive and is equipped with ball and roller bearings throughout. Machine itself is extremely rigid.

Check No. 4 on Reply Card for more Details

Welder Has Five Current Ranges

Rated at 200 amp at 30 v on 50 per cent duty cycle is the model MZ-200-S, Bantam Champ direct current arc welder, made by Hobart Brothers Co., Box 489, Troy, O. Current range is from 40 to 250 amp at an operating speed of 3450 rpm. Five ranges of welding current and 100 steps of volt-ampere adjustment are available in each range.

Generator is of the multirange type with four laminated main poles and four interpoles which are removable. A squirrel cage induction-type electric motor is used and its rotor bars are welded to form a solid copper cage. Voltage change over terminals is provided on the starting



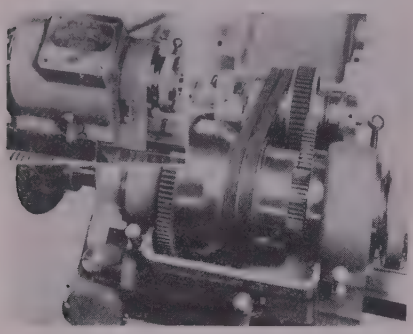
switch. Motor leads are brought out to the terminals on the starting switch and can be reconnected to change from 220 to 440 v power supply and vice versa.

Check No. 5 on Reply Card for more Details

Stepless Speeds Feature Lathe

Stepless spindle speeds from 32 to 2000 rpm feature the 1-inch collet capacity, 8½-inch swing Toolmaker's lathe of Wade Tool Co., Waltham, Mass. With back gears engaged on the model 8A lathe, the spindle speeds are from 32 to 220 rpm. The variable speed drive has an electric tachometer located on the face of the headstock housing to register spindle speeds. Operator can start, stop and brake the spindle while the motor is running.

Lathe has ample torque for low spindle speeds due to the back gear ratio of 9 to 1. Power is from a 1 hp motor. All countershaft bearings of the variable speed drive are ball bearings, permanently sealed. Lathe bed is in the shape of a hollow

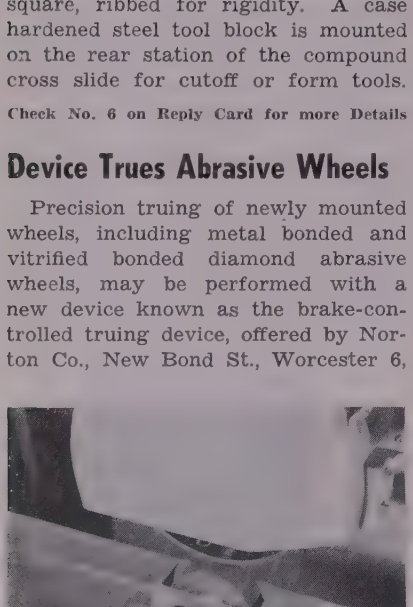


square, ribbed for rigidity. A case hardened steel tool block is mounted on the rear station of the compound cross slide for cutoff or form tools.

Check No. 6 on Reply Card for more Details

Device Trues Abrasive Wheels

Precision truing of newly mounted wheels, including metal bonded and vitrified bonded diamond abrasive wheels, may be performed with a new device known as the brake-controlled truing device, offered by Norton Co., New Bond St., Worcester 6,



Mass. It is compact, sturdily constructed and simple to set up and operate.

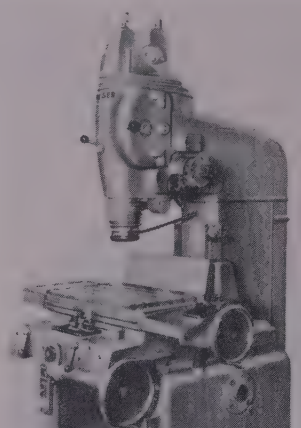
Unit is driven by the diamond wheel to be trued, eliminating the need for reducing the speed of the diamond wheel during the truing cycle.

Check No. 7 on Reply Card for more Details

Jig Grinder Has High Output

High output capacity and high accuracy are combined in the precision jig grinder made available by Hauser Machine Tool Corp., Manhasset, N. Y. The model 3S has a capacity grinding diameter of 5 inches and a quickly interchangeable spindle unit incorporating automatically-lubricated precision ball and roller bearings, driven by compressed air. By adjustment of airline pressure, spindle speeds up to 75,000 rpm are obtainable.

Bores are ground on the principle of the planetary spindle; small and medium size holes are ground with the normal high-speed grinding spindle while larger holes use a special set-off grinding head with eccentric adjustment. Provision is made



for grinding tapered holes. Spindle rotation and reciprocation can be stopped to facilitate gaging and inspection of the work during grinding. Table working surface measures 12¾ x 22 inches and has a longitudinal travel of 16 inches and a transverse travel of 10 inches.

Check No. 8 on Reply Card for more Details

Stock Feed Speeds Output

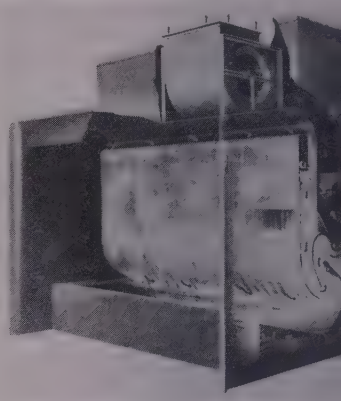
Possible speed adjustment from 66 to 838 strokes per minute is incorporated in the harmonic stock feed, an accessory for presses made by Denicon Engineering Co., 1160 Dublin Rd., Columbus 16, O. Strip stock may be fed with an accuracy of plus or minus 0.002-inch for each cycle. Tonnage, preset before the operation is started, is applied with identical pressure for each successive stroke.

Die pile-ups will not damage either press or dies. Maximum stock thickness which may be handled is 3/64-inch and ram stroke varies from 1/8 to 2½ inches. Maximum feed stroke is 3 inches and maximum strip width is 3 inches. Stepless variation is possible for all adjustments. Accessory is available for up to 8-ton eration.

Check No. 9 on Reply Card for more D

Spray Booth Washes Air

As paint-laden air is drawn over and under the water curtai multaneously in the Roto-Wash p

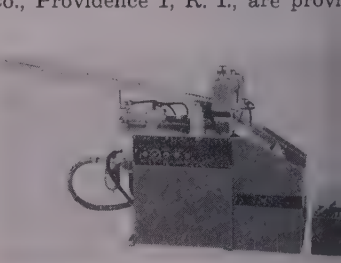


spray booth announced by Newco Detroit Co., 5741 Russell, Detroit Mich., a more even flow of ai created across the face of the bo Trapping the maximum amount paint overspray in the spraying a the booth also permits a prev of air before it enters the was section of the booth. Washing tion is created by suction from exhaust fan. As the air leaves booth, its velocity decreases shar thereby separating air and wa Remaining water is separated as air passes the moisture separator fore entering the exhaust fan. sign of the booth reduces maintena to the minimum.

Check No. 10 on Reply Card for more D

Gages Fit Individual Needs

Typical of the individual needs volume of product which can be signed into automatic and semia matic inspecting and sorting eq ment made by Brown & Sharpe M Co., Providence 1, R. I., are provi



for manual loading and dispo manual loading and automatic posal or automatic loading and a matic disposal. Machines are to segregate a product into any n ber of categories and each cate

be of any dimensional "width." Machine illustrated gages and sorts aight sleeves, measuring for length diameter at both ends. Sleeves measured into four categories: ersize and undersize in length re-dless of diameter; small in diam-r at either or both ends; either both ends large in diameter; good eves, within tolerance. Production e is about 3000 per hour and ca-ity is adjustable for various gths and diameters. It is manu-loaded with automatic disposal.

ck No. 11 on Reply Card for more Details

gh Lift Truck is Compact

Designed for interplant materials ndling and for outside work is small gas-powered fork-lift truck oduced by Elwell-Parker Electric , Cleveland, O. Equipped with a

hp air-cooled engine, its lifting-ering and tilting mechanisms are trolled by two levers located near steering wheel. Overall length uding a 30-inch fork is 102 inches. lth is 32½ inches and height with ight telescope is 83½ inches and nded 139 inches. Maximum lift 21½ inches.

ravel speed with 2000-pound ca-ity load is 6½ mph. Driver may off truck from either side. Each the widely spaced cylinders for hydraulic lifting system are placed pposite sides of the upright col-n, affording good vision of load travelway.

k No. 12 on Reply Card for more Details

h Lift Truck for Pallets

or use with single or double faced ets is the Red Giant hydraulic d lift truck, made by Revolvator North Bergen, N. J. Truck is ly operated and maneuvered and be used with any standard et. By a slide plane arrangement

the forks are raised and lowered, permitting the dual wheels in each fork to roll over sills, cross members of double faced pallets and up ramps.

Truck load is raised 4 inches by pumping the handle. Handle rotates 360 degrees and will lift in any position. Lowering is by foot lever at any speed desired and fall is cushioned to prevent noise and jar.

Check No. 13 on Reply Card for more Details

• • •

WIRE STRIPPER: High Speed Hammer Co. Inc., Rochester 5, N. Y., announces a high speed wire stripper that instantly and completely removes insulation from ends of solid, stranded, multiconductor cable or wire up to ½-inch in diameter. A positive adjustable stop is provided for any length of stripping up to 1½ inches.

Check No. 14 on Reply Card for more Details

CELL-FILLER: A new and improved Exide battery cell-filler is announced by Electric Storage Battery Co., Philadelphia 32, Pa. It will enable maintenance men to add water to storage batteries used in electric industrial trucks and tractors quickly and easily.

Check No. 15 on Reply Card for more Details

LIVE CENTERS: Ball bearing construction of the live centers made by Montgomery & Co., New York 7, N. Y., eliminates burning and regrinding, permits heavy load capacity and makes it possible for it to take a thrust load to 60,000 pounds. Available in 12 different standard models, 25 different semistandard models or made to specifications.

Check No. 16 on Reply Card for more Details

SWITCHES: Arrow-Hart & Hegeman Electric Co., Hartford, Conn., announce a new line of custom-built push-pull-selector switches. It provides a single master switch control that responds to operator's selection. Eight to 16 positions can be set up on the single dial.

Check No. 17 on Reply Card for more Details

SEALING DEVICE: Autoclench drives a self-closing staple wherever it touches and as fast as it touches. The tight closure cannot be loosened by dampness or refrigeration. Device weighs only 2 pounds and is made by Bostitch, Westerly, R. I.

Check No. 18 on Reply Card for more Details

FULL VOLTAGE STARTER: A new wall-mounted, starter adaptable for use in chemical, liquid fuel, milling, coal handling and other industries in which corrosive vapors or combustible dust laden atmospheres are present, is announced by Allis-Chalmers Mfg. Co., Milwaukee, Wis. Type 371 has its entire mechanism immersed in oil and sealed from the atmosphere. It controls squirrel cage motors and primary of wound rotor motors of 350 hp or less at 2300 v.

Check No. 19 on Reply Card for more Details

PILLOW BLOCKS: Development of a series of normal and heavy-duty spherical roller bearing pillow blocks is announced by Fafnir Bearing Co., New Britain, Conn. Spherical roller bearings for these units are made by Torrington Co., Torrington, Conn. Pillow blocks will be available in bore sizes ranging from 2 7/16 inches to approximately 8 inches.

Check No. 20 on Reply Card for more Details

HEATER: For producing hot water in large quantities, A. Gunthard Co., Ennis, Texas, offers the Hy-Flow heater. It is made in nine different normal sizes with a capacity of 3960 to 31,500 gallons per hour.

Check No. 21 on Reply Card for more Details

PLUG VALVE: Durco type A valve is a top lubricated plug valve for general chemical service at medium pressures. Made by Duriron Co. Inc., Dayton 1, O., it combines bodies of corrosion resisting ductile alloys with hard corrosion resisting plugs.

Check No. 22 on Reply Card for more Details

PLATE MAGNETS: Redesign of the line of nonelectric standard and jumbo plate magnets is announced by Eriez Mfg. Co., Erie, Pa. These plate type permanent magnets will remove tramp iron from material traveling in chutes, spouts or in pneumatic lines. Available for installation in metal or wooden chutes, feed tables, hoppers, etc.; sizes range from 4 to 72 inches wide in increments of 2 inches.

Check No. 23 on Reply Card for more Details

DUMPING DEVICE: To handle loose parts, a skip box dumping device was developed by Towmotor Corp., Cleveland, O. The three-sided box is fitted with metal rings at the back. Special hooks on lift truck carriage engage these rings when box is lifted by forks. To dump box, operator actuates a double acting hydraulic cylinder which raises hooks, tilts box.

Check No. 24 on Reply Card for more Details

INSTRUMENT VALVES: Forged steel instrument valves built by Edward Valves Inc., East Chicago, Ind., are useful in the manufacture of small control equipment which is accompanied by an instrument valve. They are available in globe or angle design in ¼, ⅜ and ½-inch sizes with screwed or socket welding and are constructed of carbon 13 per cent chromium stainless or 18-8 stainless steel.

Check No. 25 on Reply Card for more

SAFETY DEVICE: Black, Siva Bryson Inc., Kansas City 6, Mo fers a safety device that com the patented VVH pressure va vent valve with a flame arrestor which acts to prevent propagati flame into storage tanks conta volatile liquids.

Check No. 26 on Reply Card for more

ASSEMBLY KIT: Powered p loader replacement kit, announce Aerol Co. Inc., Burbank, Calif., wheel assembly that eliminates ing and chipping of floor on turns. This is accomplished by ferential action obtained throu series of three independently rot rubber tired wheels.

Check No. 27 on Reply Card for more

VIBRATION MOUNTS: Finflex H vibration mounts, introduce Finn & Co., New York 30, N are designed for use with pre grinders, lathes, generators, p and other installations where zontal and rotary machinery v tions are present. Vibration isol and attendant noise reduction i complished through "rubber-in-s principle.

Check No. 28 on Reply Card for more

HOLDER: A new holder feat vertical adjustment has been d oped by Bokum Tool Co., De Mich., to accommodate the comp large boring and threading tool is bored to take shanks of 1½ diameter directly and with split ings it will accept tool shanks to ½-inch diameter.

Check No. 29 on Reply Card for more

HANDLING ARMS: From o four drums or barrels of ma may be safely handled at the time without pallets with the four drum handling arms that available for the Hyster Load- attachment mounted on the 4 truck made by Hyster Co., Por 8, Oreg.

Check No. 30 on Reply Card for more

FOR MORE INFORMATI
on the new products and equipm in this section, fill in a c It will receive prompt atten

Helpful Literature

Double-Acting Air Cylinders

llows Co. — 12-page illustrated tin No. PD-120 lists available of Power Dome nonrotating le-acting air cylinders including flange, front flange, double-end or side, pivot, trunnion and rear e mounting types. Various types and and foot controls are de- ed also.

Sheet Cutting Machine

nerican Pullmax Co.—6-page il- ated folder "Pullmax Plate & t Cutting Machines" describes n different sizes of sheet steel and working machines with capaci- ranging from 14-gage to 11/32- ild steel. Also discussed are at- ments for straight, circle and cutting as well as beading and ng.

Raw Sewage Pumps

ffalo Pumps, Inc.—32-page bulle- 64-E contains descriptions of line onclogging pumps for sewage lift ons, sewage treatment plants, ge circulation or agitation and ge removal. Line includes ver- and horizontal solid shell mod- horizontal diagonally-split shell ps and self-priming horizontal ps.

Corrosion-Resisting Valve

riron Co.—Illustrated leaflet No. presents information on type D lubricated plug valve which com- s corrosion resistance of Duriron Durichlor alloys with effective sure lubrication for positive me- ical operation.

Alphabetical Collator

ternational Business Machines .—6-page illustrated folder form 52-5730-1 describes electronic hine which will interfile, select, pare and verify sequence of cards hed with such varied forms of rol data as letters, digits and ial characters. It operates at d of 240 cards per minute.

Quenching Oil

dman Chemical Co.—12-page in- d brochure contains data on new mineral quenching oil for hard- g and slow cooling of steel. It be used cold, has low carry-out 270° F flash point, and can be on many types of water-harden- teels without distortion or crack-

Prelubricated Bearings

stinghouse Electric Corp.—Illus- d booklet B-4378 presents facts t prelubricated bearings used in Line electric motors. Sections ss desirable qualities of grease, to prove adequacy of grease tests to prove seal effectiveness. cal case hisories are cited.

81. Rust Preventives

E. F. Houghton & Co.—8-page illustrated manual "A New All-Star Line-Up of Rust Preventives" describes eleven Rust Veto rust preventive compounds for coating metals to protect them from exposure and corrosive fumes. Line includes three dry film solvent types, oil solvent type, fingerprint neutralizer, three oil and two grease types of rust preventives and concentrate for economical plant dilution.

82. Motor Starter

Allis-Chalmers Mfg. Co.—4-page illustrated bulletin No. 14B7215 discusses features of manually operated reduced voltage auto-transformer motor starter for use with two-phase, three-wire or three-phase motors driving pumps, blowers, conveyors, compressors, fans or other machines where reduced voltage starting and manual control are desired.

83. Processing Equipment

Patterson Foundry & Machine Co. —36-page illustrated catalog CEC-49 lists line of chemical and processing equipment which includes grinding, mixing, classifying, processing, heat exchange, hydrogenating, gas absorbing and other industrial equipment.

84. Drill Jig Bushings

Colonial Bushings, Inc. — Catalog No. B-649 is designed for quick reference to all vital dimensions and information on standard drill jig bushings and liners. Included is information on ordering standard and special bushings, material specifications and grinding stock allowed in addition to table of drill sizes and decimal equivalents.

85. Combustion Recorder

Bailey Meter Co.—16-page illustrated bulletin No. 150-A depicts design improvements and new applications for Combustibles recorder electronic type instrument which operates on catalytic combustion principle. Also described is recorder's highly accurate alternating current measuring circuit.

86. Trimming Dies

Steel Products Engineering Co., Brehm Die Div.—Illustrated broadside "Brehm-Trimmed in One Press Stroke" shows numerous parts which have been trimmed by Brehm dies. These dies will trim quickly and accurately parts having edges that are straight, notched, angular, with projections and with some curved edges.

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87. Flotation Process

Denver Equipment Co.—24-page illustrated bulletin No. F10.B29 is entitled "Denver 'Sub-A' Flotation." Developed originally for recovery of mineral values from complex ores, froth flotation is used also in processing of metallic and nonmetallic ores; for de-inking paper pulp; recovering oils, greases and metal filings from industrial wastes; and processing wastes.

88. Automatic Machines

National Acme Co.—44-page illustrated bulletin TP 44 deals with tooling practices actually used on 44 different bar machine setups in plants using Acme-Gridley multiple spindle machines. Topics covered include normal tooling practices, secondary operations, magazine work loaders, special bar machine uses, range of models and sizes in line of bar automatics, and service and parts manuals.

89. Wire Window Guards

Buffalo Wire Works Co.—4-page illustrated publication form No. 592 describes window guards made of square diamond mesh or square mesh wire cloth and with plain rod, angle iron, channel iron, rounded top rod, removable rod or convex rod frame.

90. Roll Turning Lathe

Monarch Machine Tool Co. — 12-page illustrated booklet "The Monarch Roll Turning Lathe" deals with template-controlled roll turning lathe designed to simplify and speed up contour turning of steel mill rolls. It is available in two lengths to accommodate rolls up to 102 and 126 in. in length and is capable of turning infinitely diverse variety of shapes on roll face as well as handling necks at same setup.

91. Ball & Roller Bearings

Gwilliam Co.—16-page illustrated catalog No. 25 describes ball and roller thrust, thrust step, journal and industrial bearings; steel, bronze, Monel and stainless steel balls; steel rolls and special bearings. Design details, dimensions, load ratings and other data are given on each type of bearing. Included are list prices.

92. Multistage Turbines

De Laval Steam Turbine Co.—24-page illustrated catalog 4200 is guide to line of multistage turbines for all classes of stationary and marine service. Available in capacities up to 20,000 hp and in units incorporating both simple pressure staging and combined pressure and velocity staging, turbines are of impulse type.

93. Laboratory Furniture

Fisher Scientific Co.—16-pag lustrated catalog B describes ized laboratory furniture which be easily and quickly installed as single units or complete arr ments. Helpful feature is grou typical layouts for specific use restricted areas.

94. Spray Painting Equipme

M & E Mfg. Co.—62-page trated catalog A-48 presents com line of industrial paint spr equipment including spray guns, spray exhaust booths and com paint spray finishing systems. prehensive price list section i cluded also.

95. Stainless Steel

Timken Roller Bearing Co., & Tube Div.—10-page illustrated stock list covers sizes, finishes types of stainless steel availabl immediate shipment from mill . Bar stock is made in rounds, squ hexagons and flats, with some able as seamless tubes.

96. Pneumatic Chisels

Cleco Div., Reed Roller Bit Co. page illustrated bulletin No. lists pneumatic chisels for sta chippers and scaling ham chisels and blanks with safet tainer shank, and various other for industrial application.

97. Push-On Type Nut

Palnut Co.—Illustrated leaflet nut Acorn Pushnut" deals with d ative push-on type nut for ¼-in threaded rod. It requires no th ing, notching or use of cotter pushes in easily and yet has removal resistance.

98. Powder Metallurgy

F. J. Stokes Machine Co.—36- illustrated booklet "Powder Met gy Today" covers such subject how things are made from powders, general and special ap tions of powder metallurgy, me ical characteristics of powder parts, and design of parts.

99. Air Control Valves

Valvair Corp. — 4-page illust folder A shows and presents info tion on knob, lever, cam, clevis, treadle, single and double cyli single diaphragm and double phragm operated types of air trol valves. They are suitable use with air, water or oil pres up to 200 psi and temperature to 120° F.

100. Weld Rods

Coast Metals, Inc. — 8-page trated booklet 949 deals with surface weld rods and hard cast Hard surfacing, roll and miscel ous mill applications are set Comparison tests of metals emp in various operations are depicte

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8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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Market Summary

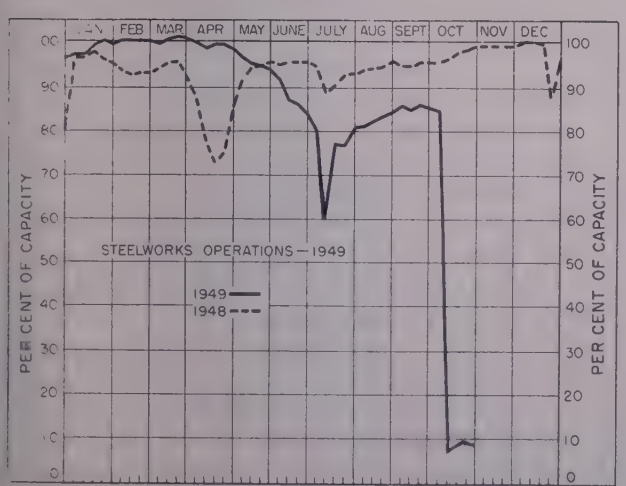
ADVERSE effects of the steel strike will be felt in the metalworking industries for many weeks after the walkout ends. Whether the work stoppage ends soon or extends into November, so much steel production will have been lost that supply difficulties will be felt into early 1950, at least in the popular products. This condition will hamper fabricating operations until the mills again approach balance between supply and demand. This, in the opinion of most observers, will take several months.

PRODUCTION—Close to 6 million tons of ingots are estimated lost in the first four weeks of the strike. Add to this an additional couple million tons that will be lost while the mills are resuming their pre-strike production pace, assuming the walkout ends shortly, and it appears 1949 steel output will probably not top 76 million tons, lowest postwar annual tonnage since 1946, another strike year, when only 67 million tons were turned out. Even if post-strike operations push to 100 per cent before yearend, which is unlikely, it will take the mills well into first quarter to make up the loss.

OPERATIONS— Steelmaking facilities have been strikebound now for the same number of weeks as in the early 1946 strike. During the period the ingot rate has averaged 8.5 per cent of capacity, which was better than that in the 1946 walkout. However, several additional plant shutdowns are in prospect over the next week which will bring the current rate down possibly another point or two. Last week the national ingot rate eased ½ point to 9 per cent of capacity, equal to production of only 166,000 tons. A month ago the rate was 84.5 and production 1,559,000 tons. A year ago operations were placed at 99 per cent with output running at a weekly rate of 1,782,000 tons. Last week operations declined 6 points to 46 per cent in the Cincinnati area and 4½ points to 80 per cent in St. Louis. An increase of 3 points to 58 per cent was reported in New England. Other district rates held unchanged.

DEMAND—Increasing maladjustments in fabricating activities are accompanied by noticeable easing off in steel demand as contrasted with early in the strike. Even prompt shipment tonnage from warehouses is under less pressure and gray market offerings are being declined. Some of the easing is attributable to "hold shipment" orders being received in increasing number by fabricators. To date fabricating operations have held up surprisingly well in face of shrinking steel supplies. But now, with the situation approaching crisis stage, operating curtailments are accelerating alarmingly and widespread plant shutdowns by mid-November threaten. With some form of rationing threatened post-strike, especially of the popular products, some consumers have continued to drive hard for position in mill rolling schedules. On the other hand there has been a disinclination on the part of some buyers to order too far ahead. This position is fairly general except for flat-rolled items and possibly pipe, for which there appears to be no limit to willingness of consumers to order ahead. Only restraint on part of the mills is keeping some users of these products from placing orders for shipment beyond first quarter.

PRICES—STEEL's weighted index of finished steel held unchanged last week at 152.52 compared with 151.86 a year ago, while the arithmetical price composite held at $91.64 and compared with $95.05. Price composite on steelmaking scrap increased to $26.67 from $26.17 and compared with $43.25 a year ago. Sentiment is mixed in the scrap market with the tone stronger at Chicago and somewhat easier at Pittsburgh. Buying is sluggish. Pig iron composites held unchanged and compared with those for the like week a year ago as follows: Basic, $45.60 and $46.29; No. 2 foundry, $46.10 and $46.69; malleable, $47.27 and $47.41.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 29	Change	Same Week 1948	Same Week 1947
Pittsburgh	3.5	None	97.5	104
Chicago	5.5	None*	99.5	94.5
Eastern Pa.	8.5	None	95	92
Youngstown	0	None	104	92
Wheeling	61	None	90	93.5
Cleveland	0	None	99	92.5
Buffalo	0	None	104	88.5
Birmingham	6	None	100	99
New England	58	+ 3	87	86
Cincinnati	46	— 6	104	94
St. Louis	80	— 4.5	89.5	80
Detroit	37	None	100	86
Western	21.5	+ 0.5	..	..
Estimated national rate	9	— 0.5	99	96.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Change from revised rate.

Composite Market Averages

	Oct. 27 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$91.64	$91.64	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.69	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.41	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	26.67	26.17	27.58	43.25	16.00

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 27 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh ...	3.35	3.35	3.35	3.35–55	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pittsburgh	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pittsburgh ..	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pittsburgh ..	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pittsburgh ..	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pittsburgh ..	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pittsburgh ...	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pittsburgh ...	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00-15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pittsburgh ...	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pittsburgh ...	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pittsburgh.	$7.75	$7.75	$7.75	$6.70	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Sheet bar, mill(NT)	51.78–52.00	51.78–52.00	52.00–53.57	67.00	34.00
Wire rods, ⅜-⅜", Pitts. ..	3.40	3.40	3.40	3.40-4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	24.58
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.00-46.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.67	25.46
No. 2 Fdry, Birmingham..	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry.(Birm.)del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.00	$29.00	$29.75	$42.75	$17.75
No. 1 Heavy Melt. E. Pa..	23.50	24.00	25.00	45.25	15.50
No. 1 Heavy Melt. Chicago	27.50	25.50	28.00	41.75	16.50
No. 1 Heavy Melt. Valley..	29.25	31.25	31.25	42.75	16.25
No. 1 Heavy Melt. Cleve...	26.00	26.50	26.50	42.25	15.25
No. 1 Heavy Melt. Buffalo.	27.25	27.25	28.25	48.50	17.00
Rails, Rerolling, Chicago..	41.50	41.50	41.50	66.50	22.25
No. 1 Cast, Chicago	41.50	41.50	41.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	9.25–50	9.25	10.00	15.50	8.25
Lead, St. Louis	12.80	12.80	14.55	19.30–35	6.35
Tin, New York	95.00	95.75	96.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	38.50	38.50	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	B
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$
Newark,del.	50.63	51.13	51.63	
Brooklyn,N.Y.,del.	....	52.79	53.29	
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	
Woodward,Ala. W15	38.88	39.38	....	
Cincinnati,del.	....	46.08	....	
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	
Tonawanda,N.Y. W12	46.00	46.50	47.00	
N.Tonawanda,N.Y. T9	....	46.50	47.00	
Boston, del.	55.26	55.76	56.20	
Rochester,N.Y.,del.	48.63	49.13	49.63	
Syracuse,N.Y.,del.	49.58	50.08	50.58	
Chicago District				
Chicago I-3	46.00	46.50	46.50	
Gary,Ind. C3	46.00	....	46.50	
IndianaHarbor,Ind. I-2	46.00	....	46.50	
So.Chicago,Ill. W14	46.00	46.50	46.50	
So.Chicago,Ill. C3	46.00	....	46.50	
So.Chicago,Ill. Y1	46.00	46.50	46.50	
Milwaukee,del.	47.89	48.39	48.39	
Muskegon,Mich.del.	....	51.98	51.98	
Cleveland District				
Cleveland A7	46.00	46.50	46.50	
Cleveland R2	46.00	46.50	46.50	
Akron, del. from Cleve.	48.39	48.89	48.89	
Lorain,O. N3	46.00	....	....	
Duluth I-3	....	....	46.50	
Erie,Pa. I-3	46.00	46.50	46.50	
Everett,Mass. E1	....	50.50	51.00	
Geneva,Utah G1	46.00	46.50	....	
Seattle,Tacoma,Wash.,del.	....	54.20	....	
Portland,Oreg., del.	....	54.20	....	
LosAngeles,SanFrancisco,del. ...	53.70	54.20	....	
GraniteCity,Ill. M10	47.90	48.40	48.90	
St.Louis,del.(incl. tax)	48.65	49.15	49.65	
Ironton,Utah C11	46.00	46.50	....	
Minnequa,Colo. C10	47.00	47.50	47.50	
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	
Pitts.N.&S. sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	
McKeesRocks,del.	46.95	47.45	47.45	
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	
Verona,del.	47.90	48.40	48.40	
Brackenridge,del.	48.13	48.63	48.63	
Bessemer,Pa. C3	46.00	....	46.50	
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	
McKeesport,Pa. N3	46.00	....	....	
Sharpsville,Pa. S6	46.00	46.50	46.50	
Steelton,Pa. B2	48.00	48.50	49.00	
Steubenville,O. W10	46.00	....	....	
Struthers,O. S16	46.00	....	....	
Swedeland,Pa. A3	48.00	48.50	49.00	
Philadelphia,del.	49.44	49.94	50.44	
Toledo,O. I-3	46.00	46.50	46.50	
Cincinnati,del.	51.01	51.51	....	
Troy,N.Y. R2	48.00	48.50	49.00	
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	
Youngstown C3	46.00	....	....	
Youngstown Y1	46.00	46.50	46.50	
Mansfield,O.,del.	50.26	50.76	50.76	

* Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade 2.25%.
Phosphorous: Deduct 38 cents per ton for P content of 0.70% and
Manganese: Add 50 cents per ton for each 0.50% manganese ov or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per t each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50

Jackson,O. J1, G2	$
Buffalo H1	

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2.....	
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2..	
Wenatchee,Wash. OH & Fdry, frt. allowed K2	

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon o base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$
Steelton,Pa. B2	
Philadelphia delivered	
Troy,N.Y. R2	

Semifinished and Finished Steel Products

Mill prices as reported to STEEL Oct. 27, 1949; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

OTS, Carbon, Forging (NT)
roit R7 .....$50.00
hall,Pa. C3 .....50.00

OTS, Alloy (NT)
roit R7 .....$51.00
ston,Tex. S5 .....59.00
land,Pa. C18 .....51.00
hall,Pa. C3 .....51.00
Duquesne,Pa. C3 ...51.00

ETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
semer,Pa. C3 .....$52.00
rton,Pa. C3 .....52.00
shohocken,Pa. A3 ..51.00
ley,Ala. T2 .....52.00
field,Ala. T2 .....52.00
tana,Calif. K1 .....71.00
y,Ind. C3 .....52.00
nstown,Pa. B2 .....52.00
kawanna,N.Y. B2 ..52.00
hall,Pa. C3 .....52.00
ron,Pa. S3 .....52.00
Chicago,Ill. C3 .....52.00
Duquesne,Pa. C3 ...52.00

Carbon, Forging (NT)
semer,Pa. C3 .....$61.00
falo R2 .....61.00
ton,O. R2 .....61.00
rton,Pa. C3 .....61.00
eland R2 .....61.00
shohocken,Pa. A3 ..63.00
roit R7 .....61.00
ley,Ala. T2 .....61.00
field,Ala. T2 .....61.00
tana,Calif. K1 .....80.00
y,Ind. C3 .....61.00
eva,Utah G1 .....61.00
ston,Tex. S5 .....69.00
Harbor,Ind. I-2 ...61.00
nstown,Pa. B2 .....61.00
kawanna,N.Y. B2 ..61.00
hall,Pa. C3 .....61.00
Duquesne,Pa. C3 ...61.00
Chicago,Ill. C3, R2..61.00
ren,O. C17 .....61.00

Alloy (NT)
nlehem,Pa. B2 ....$63.00
falo R2 .....63.00
ton,O. R2, T7.....63.00
shohocken,Pa. A3 ..65.00
roit R7 .....63.00
tana,Calif. K1 ....82.00
y,Ind. C3 .....63.00
ston,Tex. S5 .....71.00
nstown,Pa. B2 .....63.00
kawanna,N.Y. B2 ..63.00
sillon,O. R2 .....63.00
land,Pa. C18 .....63.00
hall,Pa. C3 .....63.00
ron,Pa. S3 .....63.00
Chicago,Ill. C3, R2..63.00
Duquesne,Pa. C3 ...63.00
ren,O. C17 .....63.00

ET BARS (NT)
nsfield,O. E6..(GT)$58.00
tsmouth,O. P12 ....52.00
ron,Pa. S3 .....52.00

NDS, SEAMLESS TUBE (NT)
ton,O. R2 .....$76.00
eland R2 .....76.00
Harbor,Ind. I-2 ...76.00
sillon,O. R2 .....76.00
Chicago,Ill. R2 ....76.00

LP
uippa,Pa. J5 .....3.25
hall,Pa. C3 .....3.25
ren,O. R2 .....3.25
ngstown C3, R2 ....3.25

E RODS
bamaCity,Ala. R2 ..3.40
eland A7 .....3.40
ora,Pa. A7 .....3.40
field,Ala. T2 .....3.40
ston,Tex. S5 .....3.95
Harbor Ind. Y1 ....3.40
nstown,Pa. B2 .....3.40
et,Ill. A7 .....3.40
Angeles B3 .....4.20
essen,Pa. P7 .....3.40
sburg,Calif. C11 ....4.05
tsmouth,O. P12 ....3.40
Chicago,Ill. R2 ....3.40
crowsPoint B2 .....3.50
ting,Ill.(1) N15 ....3.40
uthers,O. Y1 .....3.40
rance,Calif. C11 ....4.20
hester,Mass. A7 ....3.70

STRUCTURALS
Wide Flange
Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

H.-S. Low-Alloy
Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 ..5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1.4.95
Johnstown,Pa. B2 .....5.05
Lackawna,N.Y.(14) B2 .5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2 ....3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna,N.Y. B2 ..3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Portland,Oreg. O4 .....3.90
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 .....3.25

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.05
Lackawanna,N.Y. B2 ...4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.75
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2, Y1.3.40
Johnstown,Pa. B2 .....3.40
Lackawanna,N.Y. B2 ..3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)
Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ..4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, Ingot Iron
Ashland,cl(15) A10 ....3.65
Ashland,lcl(15) A10 ....4.15
Cleveland,cl R2 .....3.65
Warren,O.,cl R2 .....3.65

PLATES, Wrought Iron
Economy,Pa. B14 .....7.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.45
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1.5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 .....5.20

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky. (17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1.3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 .....3.95
Lackawanna,N.Y. B2 ..3.35
LosAngeles B3 .....4.05
Marion,O. P11 .....3.35
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11 .3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 .....3.35
Youngstown C3, R2 ....3.35

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .....3.50
Bethlehem,Pa.(2) B2 ...3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ..3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. O4 .....4.10
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I-2, Y1.3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 .....4.35
Lackawanna,N.Y. B2 ..3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ....3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls, M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 .....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ...4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13.4.00
Hartford,Conn. R2 .....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass. B5 ....4.40
Massillon,O. R2, R8....4.00
Midland,Pa. C18 .....4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 .....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 ....4.40
Readville,Mass. C14 ...4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ...4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .....4.00
Youngstown F3, Y1.....4.00

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ...4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7.....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13.4.65
Hartford,Conn. R2 .....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ..4.65
Mansfield, Mass. B5...4.95
Massillon,O. R2, R8....4.65
Midland,Pa. C18 .....4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1.....4.65

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga. A11 .....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1 .3.35
Johnstown,Pa. B2 .....3.35
KansasCity, Mo. S5.....3.95
Lackawanna,N.Y. B2 ..3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle, Wash. B3, N14..4.10
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ....3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..4.50
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Marion,O. P11 .....4.25
Pittsburgh J5 .....4.25
Seattle B3, N14 .....5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1⅛-1¼" B2.4.83
SparrowsPt.,¼-1" B2 ..4.25

RAIL STEEL BARS
ChicagoHts.,Ill.(3) I-2 ..3.25
FortWorth,Tex.(4) T4 ..4.33
Hntngtn,W.Va.(3,4) W7.3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ...3.85

BARS, Wrought Iron
Economy,Pa.(S.R.)B14..9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 ..11.30
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron
Ashland,Ky.(17) A10 ...3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.25
Ashland,Ky.(8) A10 ...3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I-2, Y1..3.25
Irvin,Pa. C3 .....3.25
Kokomo,Ind. C16 .....3.35
Lackawanna,N.Y. B2 ..3.25
Munhall,Pa. C3 .....3.25
Niles,O. M4 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 .....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ...4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I-2 ....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E6 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 .....4.00
Cleveland J5 R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ...4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 .....4.20
Ind.Harbor,Ind. I-2, Y1.4.00
Irvin,Pa. C3 .....4.00
Lackawanna,N.Y. B2 ...4.00
Middletown,O. A10 ....4.00
Niles,O. M4 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy
Cleveland J5, R2 .....6.05
Ecorse,Mich. G5 .....6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 .....6.05
Ind.Harbor,Ind. I-2, Y1.6.05
Irvin,Pa. C3 .....6.05
Lackawanna,N.Y. B2 ...6.05
Pittsburgh J5 .....6.05
Sharon,Pa. S3 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....6.05
Youngstown Y1 .....6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. C3	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
So.Chicago,Ill. C3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	5.40
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, Zincgrip No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2	5.15
Niles,O. R2	5.15
Weirton,W.Va. W6	5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5.00	...
Canton,O. R2	5.05	5.50
Fairfield,Ala. T2	5.00	5.35
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Aluminized

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville, O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I-2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Gary,Ind. C3	8.95
Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I-2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I-2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City,Ill. G4	7.70	7.95
Ind.Harb. I-2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary, Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05
Bristol,Conn. W1	...	...	6.40	8.35
Carnegie,Pa. S18	...	5.50	6.10	8.05
Chicago T6	4.25	5.65	6.25	8.20
Cleveland A7	4.00	5.50	6.10	8.05
Dover,O. G6	4.00	5.50	6.10	7.85
Harrison,N.J. C18	...	...	6.40	8.35
Mattapan,Mass. T6	4.50	5.80	6.40	8.35
NewBritn.,Conn.(10) S15	4.00	5.50	6.10	8.05
NewCastle,Pa. B4	4.00	5.50	6.10	...
NewYork W3	...	5.80	6.40	8.35
Pawtucket,R.I. N8 Cleve.orPitts.Base	4.55	5.50	6.10	8.05
Worcester,Mass.Base	4.50	5.80	6.40	8.35
Sharon,Pa. S3	4.00	5.50	6.10	8.05
Trenton,N.J. R5	...	6.30	6.90	8.85
Union,N.J. H6	4.40	6.35	6.35	8.30
Wallingford,Conn. W2	4.50	5.80	6.40	8.05
Weirton,W.Va. W6	4.00	5.50	6.10	8.05
Worcester,Mass. A7	4.30	5.80	6.40	8.35
Worcester,Mass, T6	4.50	5.80	6.40	8.35
Youngstown C8	4.50	5.50	6.10	8.05

Pawtucket,R.I.(12) N8
Sharon,Pa. S3
Worcester,Mass. A7
Youngstown C8

STRIP, Cold-Rolled Carbo

Berea,O. C7
Bridgeprt,Conn.(10) S1
Butler,Pa. A10
Chicago,Ill. T6
Cleveland A7, J5
Detroit D2, D3
Detroit M1
Dover,O. G6
Ecorse,Mich. G5
Follansbee,W.Va. F4
Fontana,Calif. K1
Ind.Harbor,Ind. I-2
Lackawanna,N.Y. B2
LosAngeles C1
Mattapan,Mass.(21) T
Middletown,O. A10
NewBritain(10) S15
New Castle, Pa. B4, E
NewHaven,Conn. A7, I
NewKensington,Pa. A6
NewYork W3
Pawtucket,R.I.(11) N
Pawtucket,R.I.(21) N
Pawtucket,R.I. R3
Pittsburgh J5
Riverdale,Ill. A1
Sharon,Pa. S3
SparrowsPoint,Md. B2
Trenton,N.J.(13) R5
Wallingford,Conn. W2
Warren,O. R2, T5
Weirton,W.Va. W6
Youngstown C8, Y1

STRIP, Cold-Rolled, High-strength Low-Allo

Cleveland A7, J5
Dover,O. G6
Ecorse,Mich. G5
Fontana,Calif. K1
Lackawanna,N.Y. B2
Pittsburgh J5
Sharon,Pa. S3
SparrowsPoint,Md. B2
Warren,O. R2
Weirton,W.Va. W6
Youngstown Y1

STRIP, Electro Galvanize

Weirton,W.Va. W6
Youngstown C8

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I-2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEET SILICON (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I-2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	6.70	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cld. Roll. Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons, Henry
D6 Driver Harris Co.

E1 Eastrn. Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel
G5 Great Lakes Steel
G6 Greer Steel Co.

H1 Hanna Furnace Co
H4 Heppenstall Co.
H6 Hind Steel Co. Inc.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Cor
I-4 Ingersoll Steel Div. Borg-Warner Co

J1 Jackson Iron & Ste
J3 Jessop Steel Co.
J4 Johnson Steel & W
J5 Jones & Laughlin S
J6 Joslyn Mfg. & Supp
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-M
K3 Keystone Drawn
K4 Keystone Steel & W
K5 Kidd Drawn Steel

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric St
L5 Lockhart Iron & St

, Hot-Rolled, gh-Strength Low-Alloy

mer,Ala. T2	4.95
land J5	4.95
e,Mich. G5	5.15
field,Ala. T2	4.95
ana,Cal. K1	6.64
Ind. C3	4.95
Harb,Ind. I-2, Y1	4.95
awanna,N.Y. B2	4.95
burgh J5	4.95
n,Pa. S3	4.95
rowsPoint,Md. B2	4.95
en,O. R2	4.95
ton,W.Va. W6	4.95
gstown C3, Y1	4.95

T COOPERAGE HOOP

ata A11	3.60
dale,Ill. A1	3.60
n,Pa. S3	3.60
gstown C3	3.60

, Cold-Rolled Flat

ago T6	5.35
ard A7	5.00
r O. G6	5.00
oria,O. S1	5.50
mo,Ind. C16	5.00
illon,O. R8	5.00
ssen,Pa. P7	5.00
ucket,R.I.(11) N8	5.55
ucket,R.I.(12) N8	5.50
ton,N.J. R5	5.80
ester,Mass. A7	5.30
ester,Mass. T6	5.30

, Fine and Weaving in. Coils)

onville,Ill.(19) K4	7.70
ago W13	7.70
eland A7	7.70
oria,O. S1	7.70
stown,Pa. B2	7.70
omo,Ind. C16	7.70
smouth,O. P12	7.70
thers,O. Y1	7.70
ton,N.J. R5	8.50
kegan,Ill. A7	7.70
ester,Mass. A7, T6	8.00

E (16 gage)	An'ld. Galv. Stone	Stone
ippa J5	9.05	10.55
nvill(19) K4.	9.05	10.55
eland A7	9.05	10.55
oria,O. S1	9.15	10.65
stown B2	9.05	10.55
omo C16	9.05	10.10
kegua C10	9.40	10.90
.Cal. C11	9.40	10.90
mth.(18) P12	9.05	10.55

SparrowsPt., B2	9.15 10.65
Struthers Y1	9.05 10.55
Waukegan A7	9.05 10.55

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Fostoria,O.(24) S1	4.50
Houston S5	4.55
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Millbury,Mass.(12) N6	4.45
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.15
Newark,6-8ga. I-1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7,T6	4.45

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.55
Alton,Ill(1) L1	5.55
Bartonville,Ill.(19) K4	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	6.05
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7	5.55
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Trenton,N.J. A7	5.85
Trenton,N.J. R5	6.35
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W12	5.85

WIRE	Mild Plow	Plow	Imp. Plow
onville,Ill. K4	7.10	7.40	7.80
eland A7	7.50	7.80	8.20
ora,Pa. A7	7.50	7.80	8.20
oria,O. S1	8.00	8.30	8.70
stown,Pa. B2	7.50	7.80	8.20
essen,Pa. P7	7.50	7.80	8.20
Haven,Conn. A7	7.80	8.10	8.50
smouth,O. P12	7.50	7.80	8.20
rowsPoint,Md. B2	7.60	7.90	8.30
thers,O. Y1	7.50	7.80	8.20
ton,N.J. A7	7.80	8.10	8.50
ton,N.J. R5	8.00	8.30	8.70
kegan,Ill. A7	7.50	7.80	8.20
amsport,Pa. B2	7.60	7.90	8.30
cester,Mass. J4	7.50	7.80	8.20

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.City. R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	4.90	5.35
Bartnville.(19) K4	4.80	5.25
Cleveland A7	4.80	5.25
Crawfrdvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5.	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
SparrowsPt. B2	4.90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Torrance,Cal. C11	5.75	...
Worcester A7	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Cleveland A7	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburgh,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill(1) N15	123

FENCE POSTS

	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt,Pa., S19	n.t.$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga. R2	175
AlabamaCity,Ala. R2	109
Aliquip.,Pa.9-14½ga. J5	109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop

	Col.
AlabamaCity, Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa, Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAILS & STAPLES, Stock (To Dealers & Mfrs.)

	Col.
AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa, Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS & STAPLES, Stock (To Jobbers)

	Col.
Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa, Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Worcester,Mass. A7	5.50

NAILS, Cut (100 lb keg)

Conshohoken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I-2	4.05
Lackawanna,N.Y. B2	4.05
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I-2	4.25
Joliet,Ill. C3	4.25
Lackawanna,N.Y. B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
Lebanon,Pa. B2	5.35
Minnequa, Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I-2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...	(16)3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

Key to Producing Companies

Lone Star Steel Co.
Lukens Steel Co.
McLouth Steel Corp.
Mahoning Valley Steel
Medart Co.
Mercer Tube & Mfg. Co.
Mid-States Steel & Wire
Midvale Co.
Missouri-Illinois Furnace
Moltrup Steel Products
Monarch Steel Co.
National Supply Co.
National Tube Co.
Nelsen Steel & Wire Co.
New Eng.High Carb.Wire
Newman-Crosby Steel
Niles Rolling Mill Co.
Nrthwst. Steel Roll. Mills
Northwestern S.&W. Co.
New Delphos Mfg. Co.
Oliver Iron & Steel Corp.
Oregon Steel Mills
Pacific States Steel Corp.
Pacific Tube Co.
Pilgrim Drawn Steel
Pittsburgh Coke & Chem.
Pittsburgh Steel Co.
Pittsburgh Tube Co.

P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal-Cyclops Steel
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn. Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	89.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 2" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ½ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv. B	Elec. Weld Black C	Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

BOLTS, NUTS

(To consumers)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ⅝ x 6 in., shorter. 37
¾-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Light	Reg. & Heavy
⅞-in., smaller	.41 off	.....
½-in., smaller	.....	38 off
½-in.-1-in.	....39 off	.....
⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	.37 off	35 off
1⅝-in., larger	.34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller..51 off
¾, ⅞, & 1 x 6-in. & shorter .....35 off
Headless, ¼-in., larger..31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 6.75c
⅞-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2
Baltimore, bars, wire and structurals A10
Brackenridge, Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4
Butler, Pa., sheets and strip except Types 309, 501 & 502 A10
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7
Detroit, strip, except Type 309 quoted 51.00c M1
Dunkirk, N.Y., bars, wire A4
Duquesne, Pa., bars C3
Gary, Ind., sheets except Type 416 C3
Harrison, N. J., strip C18
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2
McKeesport, Pa., bars; sheets except Type 416, C3
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2
Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10
Midland, sheets & strip C18
Munhall, Pa., bars C3
Pittsburgh, sheets C18
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4
So. Chicago, Ind., bars & structurals C3
Syracuse, N. Y., bars, wire & structurals C18
Titusville, Pa., bars U4
Wallingford, Conn., strip W2
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4
Watervliet, N. Y., structurals & bars A4
Waukegan, bars & wire A7
West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4
Youngstown, strip C8.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5½	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
	CARBON	
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.

High-heat Duty: Salina, Pa. $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Oriviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W.Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical - bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead - burned, ⅝" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg. ..19.00-23.50
Industrial xylol ..20.50-26.50
Per ton bulk, ovens
Sulphate of ammonia ..$45.00
Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots ..14.00
Do., tank cars 12.50

ORES

LAKE SUPERIOR IRON O

Gross ton, 51½% (natu
lower lake ports. An
crease or decrease in
freight rates, dock han
charges and taxes th
are for buyer's account
Old range bessemer ...
Old range nonbessemer.
Mesabi bessemer .....
Mesabi nonbessemer ..
High phosphorus .....

EASTERN LOCAL OR

Cents, unit, del. E.
Foundry and basic 56.6
concentrates, contract.

FOREIGN ORE

Cents per unit, c.i.f. A
tic ports
Swedish basic, 60 to 68
Spot: .....
Long-term contract..
Brazil iron ore, 68-69%

TUNGSTEN ORE

Wolframite, scheelite, n
ton unit, duty pd.. $2

MANGANESE ORE

Long term contracts,
inal; nearby, 48%,
paid, 81.8c-83.8c per lon
unit, c.i.f. U.S. ports;
on lower grades adjust
Mn content and impuri

CHROME ORE

Gross ton f.o.b. cars,
York, Philadelphia,
more, Charleston, S. C.
ocean freight differentia
delivery to Portland,
or Tacoma, Wash.
Indian and African
48% 2.8:1 .....$
48% 3:1 .....
48% no ratio.....28.50-
South African Transvaa
44% no ratio....$19.00-
45% no ratio.....19.50-
48% no ratio.....27.00-
50% no ratio.....28.50-
Brazilian
44% 2.5:1 lump.....$
Rhodesian
45% no ratio....$20.00-
48% no ratio.....28.00-
48% 3:1 lump .....
Domestic—rail nearest
48% 3:1 .....$

MOLYBDENUM

Sulphide conc., lb, Mo,
cont. Mines .....

METALLURGICAL C

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-
Connellsvll, fdry. 15.50-
New River, foundry ..
Wise county, foundry..
Wise county, furnace..

OVEN FOUNDRY COK

Kearny, N. J., ovens..$
Everett, Mass., ovens .
New England, del.‡ .
Chicago, ovens .....
Chicago, del. .....†
Detroit, del. .....
Terre Haute, ovens....
Milwaukee, ovens .....
Indianapolis, ovens ....
Chicago, del. .....
Cincinnati, del. ....
Detroit, del. .....
Ironton, O., ovens ....
Cincinnati, del. .....
Painesville, O., ovens..
Buffalo, del. .....
Cleveland, del. .....
Erie, del. .....
Birmingham, ovens ....
Philadelphia, ovens ....
Swedeland, Pa., ovens..
Portsmouth, O., ovens..
Detroit, ovens .....
Detroit, del. .....*
Buffalo, del. .....
Flint, del. .....
Pontiac, del. .....
Saginaw, del. .....

Includes repres
tive switching charge
*, $1.05; †, $1.45, one-
charge being $1.20,
tracks $1.40, and thre
more tracks $1.50.
within $4.03 freight
from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
[l]e York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
[l]e York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
[s]on (city) ..	5.75	6.75[**]	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
[s]on (c'try) .	5.55	6.55[**]	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
[P]. (city)...	5.90	6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
[P]. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
[P]. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.05	...	5.51	5.71	7.16
[P]. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	5.91	...	5.36	5.56	7.01
[P]ilk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
[P]. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
[P]lo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
[P]lo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
[P]. (w'hse)..	4.85	5.75[4*]	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
[P]eit (w'hse).	5.32	6.22[4*]	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
[P]land (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
[P]. (w'hse) .	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
[P]n. (w'hse).	5.27‡	5.94[**]	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
[P]igo (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[5]	5.10	5.30	6.75
[P]igo (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[5]	4.90	5.10	6.55
[P]aukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[5]	5.23	5.43	6.88
[P]au. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[5]	5.08	5.28	6.73
[P]Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
[P]. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
[P]'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
[P]'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
[P]ha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
[P]Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
[P]. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
[P]n Francisco..	6.15[10]	7.50[8]	7.80	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
[P]ele-Tacoma.	6.70‡	8.15[8]	8.80	6.70[7]	...	6.20[7]	8.15[2]	10.10	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage [e]a excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-[r]ed bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—[0]00 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

Manganese Alloys

[S]pelelsen: (19-21% Mn, 1-3% Si) Carlot per [g]ross ton, $65, Palmerton, Pa.; $66, Pitts-[b]urgh and Chicago; (16% to 19% Mn) $1 per [g]ross ton lower.

[S]tandard Ferromanganese: (Mn 78-82%, C 7% [m]ax.) Carload, lump, bulk $172 per gross [t]on of alloy, c.l., packed, $184; gross ton lots, [p]acked, $199; less gross ton lots, packed, $216; [c]. Alloy, W. Va., Niagara Falls, N. Y., [W]elland, Ont. Base price: $174, f.o.b. Bir-[m]ingham and Johnstown, Pa., furnaces; $172, [A]ldan, Pa.; $175, Etna, Pa. Shipment from [P]acific Coast warehouses by one seller add $33 [a]bove prices, f.o.b. Los Angeles, San Fran-[c]isco, Portland, Oreg. Shipment from Chicago [w]arehouse, ton lots, $214; less gross ton lots, [a]dd f.o.b. Chicago. Add or subtract $2.15 for [e]ach 1% or fraction thereof, of contained man-[g]anese over 82% and under 78%, respectively.

[M]edium-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. [7]% C, 24.75c per lb of contained Mn, car-[l]oad packed 25.5c, ton lot 26.6c, less ton 27.3c. [D]elivered. Deduct 0.5c for max. 0.15% C [g]rade from above prices, 1c for max. 0.30% C, [2]c for max. 0.50% C, and 4.5c for max. [1]% C—max. 7% Si. **Special Grade:** (Mn [8]0-85% approx., C 0.07% max., P 0.06% max.). [A]dd 0.5c to above prices. Spot, add 0.25c.

[M]edium-Carbon Ferromanganese: (Mn 80-85%, [m]in. 75% max., Si 1.5% max.). Carload, lump, [b]ulk, 18.15c per lb of contained Mn, carload [p]acked 18.9c, ton lot 20.0c, less ton 21.2c. De-[l]ivered. Spot, add 0.25c.

[M]anganese Metal: (Mn 96% min., Fe 2% [m]ax., Si 1% max., C 0.20% max.). Carload [l]ots, D, packed 35.5c per lb of metal, ton lot [1]c less ton 39c. Delivered. Spot, add 2c.

[M]anganese, Electrolytic: Less than 250 lb, [2]5c per lb 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, [3]0c per lb 36,000 lb or more, 28c. Premium for [h]ydrogen-removed metal 1.5c per pound, f.o.b. [K]noxville, Tenn., freight allowed to St. [L]ouis or to any point east of Mississippi.

[S]ilicomanganese: (Mn 65-68%). Contract, [c]l., bulk, 1.50% C grade, 18-20% Si, 8.95c [p]er lb of alloy, carload packed, 9.70c, ton lot [1]0c, less ton 11.60c. Freight allowed. For [l]ow C grade, Si 15-17.5%, deduct 0.2c from [a]bove prices. Spot, add 0.25c.

Chromium Alloys

[H]igh-Carbon Ferrochrome: Contract, c.l., [l]p, bulk, 20.5c per lb of contained Cr, c.l., [p]acked 21.4c, ton lot 22.55c, less ton 23.95c. [D]elivered. Spot, add 0.25c.

[L]ow-1" High-Carbon Ferrochrome: (Cr 60-65%, [C] 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to [h]igh-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload. 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.00c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

(Please turn to page 110)

Metal Fabricators Curtail Output

Inventories of raw materials become increasingly unbalanced by growing shortage of steel. Straits tin drops to 95.00c while prime western zinc rises to 9.25c to 9.50c

New York—Adverse effects of the steel strike are spreading rapidly throughout the nonferrous metal consuming industries. A large segment of the galvanizing and tinning industries closed Oct. 1 and now brass mills and other fabricators of metals are curtailing operations. The shutdown of steel mills is causing inventory dislocations which will become increasingly severe until the flow of steel resumes its normal rate. The decline in consumption has not undermined the price structure of major metal markets and has had only a mildly restraining influence on buying. Reconstruction Finance Corp. reduced the price of tin to the basis of 95.00c, New York, for prompt delivery of Grade A metal to meet the price which was established Sept. 26 by the British Ministry of Supply and which has been followed by the Dutch and Belgian producers. The price of zinc rose Thursday to a range of 9.25c to 9.50c, East St. Louis.

Copper—Many market observers believe copper would be selling at a higher level if the steel strike had not slowed general industrial activity. Bookings of copper for delivery in November exceed estimated mine production for that month, while inquiry for December copper indicates the shortage may continue to the yearend. Failure of workers at American Metal Co.'s Carteret copper refinery to accept the company's terms for a new working agreement will extend the shortage of certain shapes which has developed since the four-month old strike began at that plant.

Although inquiry continues heavy, sales are limited by the negligible tonnages available for November delivery. Prices hold at 17.62½c for electrolytic, delivered Connecticut.

Improvement in copper and brass mill business has been steady in the last five months. Actual consumption of copper totaled 114,760 tons in September compared with 88,088 tons in August and only 61,383 tons in May, the low for the year to date. Consumption last month was 11,645 tons in excess of intake. Fabricators' total stocks and purchases increased 3779 tons in September to 96,481 tons, while unfilled orders declined 8671 tons to 180,097 tons. This leaves a deficit of 83,616 tons in fabricators' stock position compared with 96,066 tons at the end of August and 151,060 tons at the beginning of the year.

Brass and Bronze Ingots—Manufacturers have increased prices ½-cent to ¾-cent a pound on most grades of brass and bronze ingots. The upward revision in prices is attributed solely to increased costs due to the advance in red metal scrap prices. Ingot makers are offering up to 14.75c for No. 1 copper, 13.75c for No. 2 and 12.75c for light copper. Although demand improved moderately in the third quarter, it is still light compared with bookings in the first quarter. The market is quoted 16.00c to 17.25c for ingot No. 115 in the 85-5-5-5 group, 25.25c for No. 215 in the 88-10-2 group, 21.75c for No. 305 in the 80-10-10 group, and 13.75c to 15.00c for No. 405 in the yellow ingot group.

Lead—Domestic shipments of refined lead declined 6419 tons in September to 29,640 tons, reports the American Bureau of Metal Statistics. This was the smallest movement since May and brought the total for the first nine months to 287,605 tons, or 111,275 tons less than were shipped during the like 1948 period. Shipments dropped to 14,064 tons in September from 18,802 tons in the previous month to unclassified users, to 9257 tons from 10,107 tons to battery makers, to 2342 tons from 3135 tons to sundries, to 150 tons from 630 tons to jobbers, to 120 tons from 310 tons to brass mills, and to 50 tons from 100 tons to foil manufacturers. Shipments to cable manufacturers increased to 3407 tons from 2725 tons while those to ammunitions makers held at 250 tons.

Production of refined lead declined to 36,103 tons in September from 39,362 tons, bringing the total for the first nine months to 412,293 tons compared with 399,138 tons for the like period a year ago. Of September's output, 35,033 tons were accounted for by primary producers and 1070 tons by secondary sources.

Stocks of lead at refineries at the close of September dropped to 61,538 tons from 76,782 tons at the end of August.

Only moderate tonnages of lead are being sold with prices unchanged at 12.80c, St. Louis.

Makers of batteries have reduced their purchases of lead in view of the probable curtailment in automobile production over the next few weeks. Battery makers are reducing their inventories.

Zinc—The price of zinc was increased ¼-cent a pound to 9.50c, East St. Louis, by a leading custom smelter on Oct. 27. This is the first change in the price of zinc since Oct. 3 when it was lowered ¾-cent from 10.00c. This sharp drop occurred immediately following the start of the steel strike. The advance came somewhat as a surprise to the trade since buying of the prime western grade had been confined chiefly to an occasional carlot. Bulk of activity has been in regular and special high grade zinc which is widely used in the automotive industry. The latter industry is expected to curtail its production in the next few weeks due to the growing shortage of steel and to model changeovers.

Tin—Small tonnages of Grade A tin are being sold at 94.87½c, New York, but no Straits tin has been volved in the transactions to d This price is ⅛-cent under the cent level established by the Re struction Finance Corp., effective of Oct. 24, as its selling price Grade A.

Speculative offers were reporte the trade last week as low as 92 for December delivery of Grad tin but no actual sales at these le were reported. Principal impor continue to ask 95.00c for Oct and November arrivals.

London Tin Mart To Reopen

London—Dealings in tin on London Metal Exchange will be sumed Nov. 15, says George Stra British Minister of Supply. At time the British government abandon the bulk buying and sel of this metal. Trading in tin on London Metal Exchange halted 8, 1941, with closing quotations standard tin £259 for spot deliv and £262 for three months deliv or the equivalent of 46.60c for and 47.15c for futures at $4.03 sterling exchange. The British istry's price for standard tin, 9 per cent, is £757, or equivalen 94.63c on the basis of $2.80 for ling exchange.

World Tin Output Increases

New York—World production tin in concentrates increased to 800 tons in August from 12,900 in July, according to preliminary tistics issued by the International Study Group, The Hague, Net lands. Smelter production of ref tin dropped to 13,900 tons from 000 tons. Production of tin p slumped to 373,000 tons in Aug from 451,000 tons in the prece month. Exports of tin in con trates increased to 7200 tons f 7100 tons.

Acquires Anode Facilities

New York—Federated Metals vision, American Smelting & fining Co. has acquired the facili of Metallurgical Products Co., Ph delphia, for the production of e troplaters' anodes. Production be concentrated at Federated's Pe Amboy, N. J., plant under the m agement of R. D. Taylor. Me lurgical Products Co. will conti to conduct its busines in alloy specialty products.

Castings Shipments Increase

Washington—Shipments of cop and copper-base alloy castings creased 34 per cent in August t total of 58,055,000 pounds, reports Bureau of the Census. This c pares with 43,273,000 pounds in J and 81,976,000 pounds in Aug 1948. Of the August, 1949, sh ments, 53,203,000 pounds were s castings. Total shipments of kinds of copper castings amoun to only 480,607,000 pounds in the f eight months of the year compa with 677,862,000 pounds in the 1948 period.

Unfilled orders at the end August totaled 26,071,000 pou compared with 69,126,000 pounds the end of August, 1948.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

mary Metals

per: Electrolytic 17.62½c, Conn. Valley, t. 17.75c, Conn. Valley.

s Ingot: 85-5-5-5 (No. 115) 16.00-17.25c; 0-2 (No. 215) 25.25c; 80-10-10 (No. 305) 5c; No. 1 yellow (No. 405) 13.75-15.00c.

: Prime western 9.25-9.50c, brass special , intermediate 9.75c, East St. Louis; grade 10.25-10.50, delivered.

1: Common 12.80c; chemical 12.90c; cor- g 12.90c, St. Louis.

nary Aluminum: 99% plus, ingots 17.00c, 16.00c. Base prices for 10,000 lb and , f.o.b. shipping point.

ndary Aluminum: Piston alloys 16.25- c; No. 12 foundry alloy (No. 2 grade) 0-16.25c; steel deoxidizing grades, notch , granulated or shot: Grade 1, 17.50-17.75c; le 2, 16.50-16.75c; grade 3, 15.50-15.75c; le 4, 14.75-15.25c. Prices include freight arload rate up to 75 cents per 100 lb.

titanium-aluminum alloy No. 1 (low Cu) 0c; No. 2 (2% Cu) 28.00c, f.o.b. Eddy- e, Pa.

nesium: Commercially pure (99.8%) stand- ingots, 10,000 lb and over, 20.50c, f.o.b. port, Tex.

Grade A tin, spot, 95.00c, New York; its, November arrival, 95.00c. Chinese, tin, October, 87.00-88.00c; November ar- l, 84.00-85.00c.

FC selling prices for prompt delivery, ex- t New York or f.o.b. Texas City, Tex.: le A, 99.8% or higher (including Straits) 0c; Grade B, 99.8% or higher, not meet- specs. for Grade A, with 0.05% max. nic, 94.80c; Grade C, 99.65-99.79%, incl., 0c; Grade D, 99.5-99.649%, 94.40c; Grade 99-99.499%, 94.00c; Grade F, 98-98.999%, 0c; Grade G, 95-97.999%, 91.00c. Prices grade D through Grade G are for tin ent.

imony: American 99-99.8% and over but meeting specifications below, 32.00c; 99.8% over (arsenic 0.05% max.; other impuri- 0.1% max.) 32.50c; f.o.b. Laredo, Tex., bulk shipments. Foreign, 99% (Chinese, lish, Belgium), prompt, 26.25c, New York.

el: Electrolytic cathodes, 99.9%, base sizes refinery, unpacked, 40.00c; 25-lb pigs, 0c; "XX" nickel shot, 43.50c; "F" nickel or ingots, for addition to cast iron, 0c. Prices include import duty.

cury: Open market, spot, New York $73- per 76-lb flask.

ylium-Copper: 3.75-4.25% Be, $24.50 per ntained Be.

mium: "Regular" straight or flat forms, del.; special or patented shapes, $2.15.

alt: 97-98%, $1.80 per lb for 550 lb (keg); 2 per lb for 100 lb (case); $1.87 per lb er 100 lb.

d: U. S. Treasury, $35 per ounce.

er: Open market, New York, 73.25c per oz.

inum: $69-72 per ounce.

adium: $24 per troy ounce.

ium: $100-$110 per troy ounce.

nium (sponge form): $5 per pound.

lled, Drawn, Extruded Products

COPPER AND BRASS

Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

et: Copper 31.30; yellow brass 28.19; com- cial bronze, 95%, 31.28; 90%, 30.84; red ss, 85%, 29.89; 80%, 29.47; best quality, 1; nickel silver, 18%, 41.78; phosphor- nze, grade A, 5%, 50.47.

s: Copper, hot-rolled 27.15; cold-drawn 0; yellow brass free cutting, 22.76; com- cial bronze, 95% 30.97; 90% 30.53; red ss 85% 29.58; 80% 29.16.

nless Tubing: Copper 31.34, yellow brass 0; commercial bronze 90% 33.50; red ss 85% 32.80; 80% 32.38.

e: Yellow brass 28.48; commercial bronze, 31.57; 90% 31.13; red brass, 85% 30.18; 29.76; best quality brass 29.30.

per Wire: Bare soft, f.o.b., eastern mills, 000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; therproof, f.o.b. eastern mills, 100,000 lb 24.693, l.c.l. 25.443, c.l. 24.943; magnet, vered, c.l. 27.62½, 15,000 lb or more 7½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $18.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $18.00 per cwt. Traps and bends: List price plus 48%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.
Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.
Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.
Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.
Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.
Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.
Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.
Tin Anodes: Bar, 1000 lb and over, 111.00c, 500 to 999 lb, 111.50c; 200 to 499 lb. 112.00c; less than 2090 lb, 113.50c; ball, 1000 lb and over, 113.25c; 500 to 999 lb, 113.75c; 200 to 499 lb. 114.25c; less than 200 lb, 115.75c f.o.b. Sewaren, N. J.
Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 67.9c; 100 or 300 lb drums only, 100 to 500 lb, 59.7c; 600 to 1900 lb, 57.3c; 2000 to 9900 lb, 55.5c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb 59.7c; 600 to 1900 lb, 57.3c; 2000 to 9900 lb, 55.5c; 10,000 lb and over, 54.4c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.
Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c, f.o.b. Cleveland; 39.25c, del., Detroit and Philadelphia.
Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 96.00c; more than 2000 lb, 94.00c, f.o.b. Carteret, N. J.
Stannous Chloride (Anhydrous): In 400 lb bbl, 83.00c; 100 lb kegs 84.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25; No. 2 copper 13.00; light copper 12.00; composition red brass 11.50-12.00; radiators 9.25-9.50; heavy yellow brass 8.75-9.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.50-14.75; No. 2 copper 13.50-13.75; light copper 12.50-12.75; composition red brass 12.00; radiators 9.25-9.50; heavy yellow brass 9.25-9.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.50-12.75; No. 2 11.50-11.75; light copper 10.50-10.75; No. 1 composition red brass 9.50-9.75; No. 1 composition turnings 9.00-9.25; mixed brass turnings 6.00-6.25; new brass clippings 10.00-10.50; No. 1 brass rod turnings 7.75-8.00; light brass 6.00-6.25; heavy yellow brass 6.50-6.75; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.50-7.75; cocks and faucets, 7.75-8.00; brass pipe 8.50-8.75.
Lead: Heavy 9.50-9.75, battery plates 4.75-5.00; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.75-10.00.
Zinc: Old zinc 3.50-4.00, new die cast scrap 3.25-3.75, old die cast scrap 2.50.
Tin: No. 1 pewter 48.00-50.00, block tin pipe 70.00-72.00, No. 1 babbitt 36.00-38.00.
Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
27	17.625	12.80	9.25–50	95.00	17.00	32.00	40.00	73.25
24-26	17.625	12.80	9.25	95.00	17.00	32.00	40.00	73.25
18-22	17.625	12.80	9.25	95.750	17.00	32.00	40.00	73.25
17	17.625	12.80	9.25	95.875	17.00	32.00	40.00	73.25
14-15	17.625	12.85	9.25	95.875	17.00	32.00	40.00	73.25
10-13	17.625	13.55	9.25	95.875	17.00	32.00	40.00	73.25
7-8	17.625	13.80	9.25	95.875	17.00	32.00	40.00	73.25
4-6	17.625	14.05	9.25	96.00	17.00	38.50	40.00	73.25
3	17.625	14.10	9.25	96.00	17.00	38.50	40.00	73.25
1	17.625	14.55	10.00	96.00	17.00	38.50	40.00	73.25

TE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, ne western, del. St. Louis; Tin, Straits, del, New York; Aluminum, primary ingots, 99%, del.; imony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery acked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Oct. 27, 1949; gross tons except as noted
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 27	$26.67
Oct. 20	26.17
Sept. 1949	26.07
Oct. 1948	43.25
Oct. 1944	16.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$29.00
No. 2 Heavy Melt.	27.00
No. 1 Busheling	29.00
No. 1 Bundles	29.00
No. 2 Bundles	23.00-24.00
No. 3 Bundles	22.00-23.00
Heavy Turnings	22.50-23.50
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings.	22.00
Cast Iron Borings	21.00*
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast.	39.00-40.00
Charging Box Cast	31.00-32.00*
Heavy Breakable Cast.	28.00-29.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00
Axles	35.00-36.00
Rails, Random Length.	34.00-35.00
Rails, 2 ft and under	38.00-39.00
Rails, 18 in. and under.	39.00-40.00
Railroad Specialties	32.00-33.00
Angles, Splice Bars	32.00-33.00

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	*$25.00-26.50†*
No. 2 Heavy Melt. Steel	*24.00-25.50†*
No. 1 Busheling	*25.00-26.50†*
No. 1 Bundles	*25.00-26.50†*
No. 2 Bundles	*22.00-23.50†*
Machine Shop Turnings	*15.00-17.00†*
Mixed Borings, Turnings	*17.00-19.00†*
Short Shovel Turnings	*17.00-19.00†*
Cast Iron Borings	*17.00-19.00†*
Bar Crops and Plate	*26.00-27.50†*
Punchings & Plate Scrap	*26.00-27.50†*
Cut Structurals	*27.00-29.50*

† Nominal.

Cast Iron Grades†

No. 1 Cupola	*42.00-43.00*
Charging Box Cast	*35.00-36.00*
Stove Plate	*37.00-38.00*
Heavy Breakable Cast	*33.00-34.00*
Unstripped Motor Blocks	30.50-31.50
Malleable	*36.50-37.50*
Brake Shoes	*31.00-32.00*
Clean Auto Cast	*44.00-45.00*
No. 1 Wheels	*35.00-36.00*
Burnt Cast	*32.00-33.00*

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	*29.00-29.50*
No. 2 Heavy Melt. Steel	*28.00-28.50*
No. 1 Bundles	*29.00-29.50*
No. 2 Bundles	*25.00-25.50*
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings.	22.00-23.00
Cast Iron Borings	22.00-23.00
Low Phos.	*30.00-30.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$23.50-24.50*
No. 2 Heavy Melt. Steel	22.00-22.50*
No. 1 Busheling	22.00-22.50*
No. 1 Bundles	23.50-24.50*
No. 2 Bundles	20.50-21.00*
Machine Shop Turnings	17.00
Short Shovel Turnings.	18.00
Mixed Borings, Turnings	14.00-15.00
Bar Crop and Plate	26.00-27.00
Punchings & Plate Scrap	26.00-27.00
Cut Structurals	*25.00*
Elec. Furnace Bundles	*24.50*
Heavy Turnings	23.50-24.50
No. 1 Chemical Borings	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	32.50
No. 1 Machinery Cast.	36.00-37.00*
Charging Box Cast	*34.00-35.00*
Heavy Breakable Cast	*34.00-35.00*
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast	36.00-37.00*
No. 1 Wheels	35.00-36.00*
Malleable	32.00

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	12.00
Short Shovel Turnings.	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	31.00
Heavy Breakable Cast.	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	44.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$18.00-19.00*
No. 1 Bundles	*21.00-22.00*
No. 2 Bundles	17.00-18.00
No. 1 Busheling	*21.00-22.00*
Machine Shop Turnings	*13.00-14.00*
Mixed Borings, Turnings	*13.00-14.00*
Short Shovel Turnings	*15.00-16.00*
Cast Iron Borings	*15.00-16.00*
Punchings & Plate Scrap	*21.00-22.00*

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast.	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	$27.00-27.50
No. 2 Heavy Melt. Steel	24.50-25.00
No. 1 Bushelings	24.50-25.00
No. 1 Bundles	25.50-26.00
No. 2 Bundles	23.00-23.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	19.00-19.50
Cast Iron Borings	19.00-19.50
Short Shovelings	20.50-21.00
Low Phos.	28.50-29.00

Cast Iron Grades

No. 1 Cupola	37.00-37.50
No. 1 Machinery	38.00-38.50
Mixed Yard	35.50-36.00
Malleable	34.50-35.00

Railroad Scrap

Rails, 3 ft. and under	35.00-36.00
Scrap rails	30.00-31.00
Specialties	31.00-32.00
No. 1 car wheels	32.00-33.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18.00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles.	19.00-20.00

Cast Iron Grades

No. 1 Cupola Cast	*29.00-30.00*
No. 1 Machinery	*31.00-32.00*
Charging Box Cast	25.00-26.00
Heavy Breakable	25.00-26.00
Unstripped Motor Blocks	26.00
Malleable	32.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.50-18.00
No. 2 Heavy Melt. Steel	16.00-16.50
No. 1 Bundles	17.00-18.00
No. 1 Busheling	14.00-15.00
Machine Shop Turnings	9.00-10.00
Mixed Borings, Turnings	9.00-9.50
Short Shovel Turnings.	11.00-12.00
Bar Crops and Plate	19.00-20.00
Punchings & Plate Scrap	19.00-20.00
Chemical Borings	18.00-19.00

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast.	28.00-29.00
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	*$27.00-28.00**
No. 2 Heavy Melt. Steel	*26.00-27.00**
No. 1 Bundles	*27.00-28.00**
No. 2 Bundles	*24.00-25.00**
No. 3 Bundles	16.00-17.00
Machine Shop Turnings	19.00-20.00
Mixed Borings, Turnings	19.00-20.00
Short Shovel Turnings.	20.00-21.00
Cast Iron Borings	19.00-20.00
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles	*27.00-28.00**
Heavy Turnings	23.00-24.00
Cut Structurals	*28.00-29.00**

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	37.00-38.00
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	40.00-41.00
Rails, 2 ft. and under	41.00-42.00
Rails, 18 in. and under	42.00-43.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

* Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
Machine Shop Turnings	20.00-21.00
Short Shovel Turnings.	21.00-22.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	32.00-33.00
Brake Shoes	*32.00-33.00*
Clean Auto Cast	40.00-42.00
Burnt Cast	*32.00-33.00*

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	*39.00-40.00*
Rails, Random Lengths	*33.00-34.00*
Rails, 3 ft. and under.	36.00-38.00
Uncut Tires	28.00-29.00
Angles, Splice Bars	33.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	
No. 2 Bundles	
Machine Shop Turnings	
Mixed Borings, Turnings	
Short Shovel Turnings.	
Cast Iron Borings	
Bar Crops and Plate	
Cut Structurals	

Cast Iron Grades

No. 1 Cupola Cast	34.00
Stove Plate	28.00
No. 1 Wheels	23.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	
R. R. Malleable	no
Rails, Rerolling	
Rails 3 ft. and under	25.00
Angles and Splice Bars	31.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
Nos. 1 & 2 Bundles	

Cast Iron Grades

No. 1 Cupola Cast	23.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	
Wheels	
Rails, Random Lengths	

SEATTLE

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
No. 1 Busheling	
Nos. 1 & 2 Bundles	
No. 3 Bundles	
Machine Shop Turnings	
Mixed Borings, Turnings	
Punchings & Plate Scrap	
Cut Structurals	
Elec. Furnace Bundles.	

Cast Iron Grades

No. 1 Cupola Cast	25.00
Heavy Breakable Cast.	
Stove Plate	
Unstripped Motor Blocks	
Malleable	
Brake Shoes	17.00
Clean Auto Cast	
No. 1 Wheels	

Railroad Scrap

No. 1 R.R. Heavy Melt.	
Railroad Malleable	
Rails, Random Lengths	
Angles and Splice Bars	

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
Nos. 1 & 2 Bundles	
No. 3 Bundles	
Machine Shop Turnings	
Mixed Borings, Turnings	
Punchings & Plate Scrap	
Electric Furnace Bundles	

Cast Iron Grades

No. 1 Cupola Cast	

Railroad Scrap

No. 1 R.R. Heavy Melt.	
Rails, Rerolling	

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	
No. 1 Bundles	
Mechanical Bundles	
Mixed Steel Scrap	
Mixed Borings, Turnings	
Rails, Remelting	
Rails, Rerolling	
Busheling	
Bushelings new factory, prep'd	
Bushelings new factory, unprep'd	
Short Steel Turnings	

Cast Iron Grades*

Cast	*40.00*

* Removed from price c
Aug. 9, 1947; quoted on ba
f.o.b. shipping point.

Parts are raked from heat-treating equipment into skid box on truck, then removed for cooling.

Truck platform enters annealing oven to deposit or remove loads. Truck works quickly to save gas or oil.

IN INDUSTRY'S

HOT SPOTS

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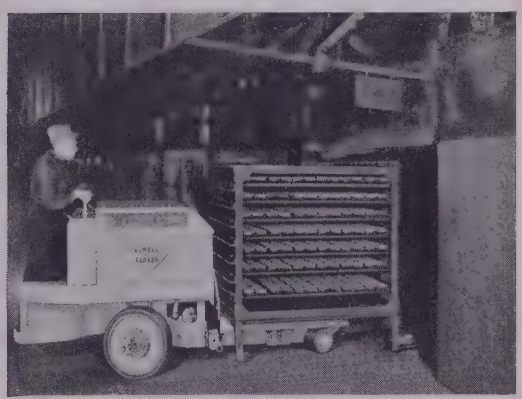
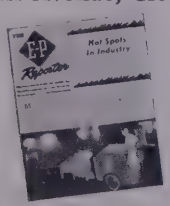
Pouring metal into bucket on truck, which then quickly carries load to foundry floor.

Working with metals at high temperatures is truly the No. 1 proving ground for industrial trucks. For over 30 years, Elwell-Parkers have operated on such work with safety, ease of control, and remarkable dependability. They readily handle jobs that are impossible manually. E-P Trucks also operate at speeds permitting synchronization of operations—so important with molten metals. Elwell-Parker electric trucks operate all over the plant, and they are assigned the toughest trucking jobs, because they always prove equal to them. The Elwell-Parker Electric Company, 4501 St. Clair Avenue, Cleveland 3, Ohio.



Moving rack holding 1,000 small cores into oven. Truck keeps ovens operating continuously.



FREE BOOKLET
on Handling of Hot Metals.
Ask for E-P Reporter No. 7.

E-P Electric Truck removing hot railway car wheels from foundry to cooling department.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

Sheets Strip . . .

Sheet and Strip Prices, Page 85 & 86 & 87

New York—If all sheet mills now closed were to come back into operation at once, none would be able to accept tonnage for shipment before end of the year on any grade, with exception of stainless sheets and possibly one or two other specialties. Most, but not all, producers are accepting orders on major grades for delivery at earliest convenience and are confining orders to regular customers. Most producers are trying to duck specifications rather than build up new backlogs as was the case early last summer. There is little rhyme or reason to future schedules. Certain mills, even including at least one which is now in operation, have not as yet officially opened their books for first quarter, but they are the exception.

Boston—If not already short of sheets, consumers eventually will be pinched by the growing scarcity. While tonnage on mills when the strike began will be given first consideration, considerable volume will not be shipped until early 1950. Cold-rolled and galvanized sheets are most extended. Bookings have slackened due to reluctance on part of some mills to further clog order books beyond January. Ahead is another period of confusion, delayed deliveries, shortages and pressure for tonnage. Because cold strip output continues at most mills, supply situation is less acute, but producers are beginning to adjust rollings to meet hot strip reserves.

Pittsburgh—Mill order backlogs of sheets and strip are expected to be substantially extended by the time the strike is ended.

Deliveries on galvanized and cold-rolled sheets already are booked four months ahead in some instances; enameling stock, three months; hot-rolled sheets and silicon sheets, slightly over two months. Producers are expected to reinstate allotments of flat-rolled steel to district offices when the strike is terminated. There is no assurance mill production schedules will be maintained at practical capacity once pipelines are filled. In fact, many interests are pessimistic in their demand forecasts. This view is based on belief current strike has seriously checked the moderate improvement in general business conditions that got under way early in July.

Supply of stainless steel will receive another serious blow if the threatened strike at Allegheny Ludlum Steel Corp.'s plants materialize on Nov. 1.

Philadelphia — Cold-rolled sheets continue under heavy demand, with buyers ordering ahead as far as possible. Mills are moving conservatively, accepting tonnages only from their regular customers for shipment in the first quarter. One mill, which is still in operation, has not opened its books for even that quarter. A district producer of hot-rolled sheets, which has continued in operation, is sold up until the end of the year and is now out of the market. Stainless steel sheets and certain other specialties can be had for delivery over the next few weeks.

Cleveland—Imposing order accumulations are building up on books of sheet and strip producers for delivery into first quarter of next year. Republic Steel Corp. is booked through the remainder of this year and is accepting tonnage from regular customers for first quarter. Other sellers, in the main, are following much the same policy. Rationing at least of an informal sort is expected once production is resumed since it now appears the mills may be unable to deliver all tonnage on schedule, necessitating shifts in delivery dates.

Cincinnati—Sheet producers still operating are under heavy pressure for prompt deliveries. There have been no cancellations due to consumer shortages of other types of steel or other requirements affected by strikes. Books for first quarter, excepting on some specialties, have not yet been opened, although requests for delivery positions are abundant. Forward buying has not reached a vigorous stage and the hesitancy is attributed to uncertainty as to ultimate effect of current labor troubles on general business.

Chicago—Users do not expect to be able to get newly ordered sheet or strip until after the first of the year. Inventories are rapidly dwindling. Mill operations, when started, will take possibly six weeks or more to turn out a normal month's production of steel. Consumers say curtailments, if they don't come before the strike is over, are certain to come afterwards and will cut almost as deeply as they would if the strike were still on. Hot-rolled material is reaching approximately the same stringent position as cold-rolled. Galvanized material is unobtainable.

Birmingham — Consumers' inventories of strip are being reduced rapidly and sharp curtailment in their operations will be necessary if the flow of fresh supplies is not augmented soon. Connors Steel Co., this city, and Atlantic Steel Co., Atlanta, are operating at capacity, but unable to meet the district's demands fully.

Los Angeles—Inventory position of sheet users is becoming precarious. Although there have been no major shutdowns in this district, several automobile assembly plants have shortened their work week to 4 days, and other consumers are expected to follow. The two cold-rolled strip mills that are in operation are able to meet needs of most of their regular customers, but can supply little tonnage for other buyers. Strike-bound mills generally are not soliciting "if and when" orders, and are accepting bookings from regular customers without delivery commitments. Some form of allocations is expected when the shutdown ends. Kaiser's Fontana mill is booking in January and February for most products, with plate and pipe on allocation, and sheet, cold-rolled strip and merchant bars likely to go on semiallocation shortly.

San Francisco—Pressure for sheets is mounting as supplies dwindle. Although no shutdowns have been reported because of lack of supplies, the full pinch of a shortage in flat-rolled items will begin to be felt by mid-November. Galvanized stock is virtually gone.

Plates . . .

Plate Prices, Page 85

New York—District plate fab ing shops are beginning to fee squeeze of the steel strike. Few have work ahead have been forc suspend entirely, but stocks ar coming further unbalanced and of output is lessening. In som stances, shifts have been re and some shopmen are slowin a bit in an effort to extend wo long as possible.

With only two plate mills op ing in the East, pressure on producers is increasingly strong they are still able to accept ton for shipment this year. Severe sure is lacking because major suming industries, including railr oil and gas industries and shipy remain quiet.

Export demand for plates dried up temporarily, due to steel strike, dollar shortages ab and various currency devaluatio

Boston—Fabricating shops' inventories are getting low in instances and costs are higher more warehouse tonnage is empl Tank builders are not able to firm delivery on new orders, volume of which is smaller. projects requiring specific volum confronted with delay. Large meter steel pipe porjects are volved. Shipyards are lowering ventory, but are not yet seric affected by shortages.

Philadelphia—Plate buying co ues far from active. Some mills, d because of the strike, report th they were to resume immedia they could get out tonnage ag new orders within three weeks. M while, the two district mills w continue in operation, are still to accept tonnage for shipment be end of the year. The only really tive spot in demand for plate for light fuel oil tanks. Ordering jobbers is somewhat better. One trict railroad has so much ex tonnage on hand that it has off to sell plates to other railroads cost.

Cleveland—Somewhat slower mand for plates is noted here manufacturing plants beginning curtail operations due to unbala inventories or "hold" orders. S gray market tonnage is being offe An eastern seller has been see to dispose of one lot at about 1 over the regular market. Several of so-called manufacturers' "exc tonnage also are being actively fered.

Los Angeles—Supplies of he plate are fairly good, with Ka continuing to produce, and fabricators and jobbers gener well supplied at inception of the st Supplies of light plate, 10 and gage, which is not locally produ are tight. This type is widely by fabricators of bolted tanks oil fields, and they are feeling pinch. One firm took orders on e such tank it had material for wi 24 hours after the steel shutdow

Seattle—Largest plate project mediately pending is the Lucky F dam in Idaho, requiring 900 t Plate fabricators report new busi confined to small tonnages.

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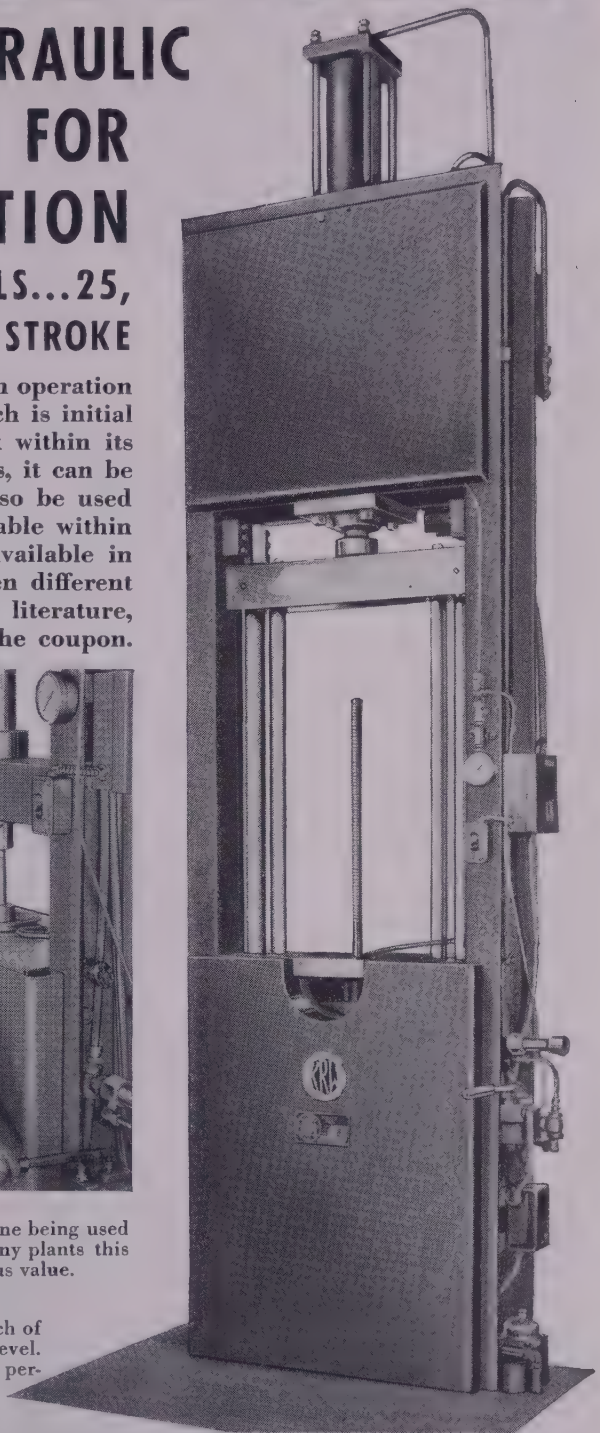

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82

Steel Bars . . .

Bar Prices, Page 85

Pittsburgh—The few cold-finished bar producers not idled by the steel strike are expected to terminate operations by Nov. 1, due to depleted stocks of hot-rolled material. Some cold finishers estimate it will require nearly three weeks after mills resume operations before hot-rolled inventories will be adequate to reopen plants. This situation will not apply to those cold finishers struck Oct. 1 because their stocks of hot-rolled material were equivalent to three to four weeks' needs in most instances. Due to the favorable supply-demand relationship of carbon and alloy cold-finished bar items prior to the strike, customers' stocks were somewhat larger than those of flat-rolled products. Cold finishers are concerned over lack of interest among customers to get on mill production schedules because of the probability that delivery promises will be much further extended soon after termination of the strike.

New York—Some leading carbon bar sellers and most producers of hot alloy bars can offer large sized bars for December delivery, if they are able to get their mills back in operation by Nov. 1.

Deliveries on hot carbon bars in the small and medium sizes can not be made this year, insofar as new orders are concerned. Some leading sellers are booked well into the first quarter and are hesitating to accept more tonnage until they know more definitely what the outlook is going to be.

Cold-finished bars are in fairly good supply. With some important exceptions, most cold drawers are in operation, although stocks of hot material are becoming increasingly unbalanced and their finished bar inventories are beginning to dwindle. Consumers are able to obtain most sizes for shipment within a few weeks by shopping around.

Boston—Carbon and alloy bar consumers are beginning to run short of certain sizes and grades and are filling in needs from warehouse. Stocks of bars, notably cold-finished, held by larger users are substantial for current operations, but some forward protective buying for future delivery has developed. Mild improvement in finished products fabricated from bars has held.

Cleveland—Despite slackening in manufacturing generally because of unbalanced steel inventories and order cancellations, hot carbon bar sellers here are in receipt of substantial new business. Deliveries depend on the length of the strike but it looks as though some tonnage accepted for fourth quarter will carry over into first quarter. This backing up may result in a much tighter supply situation than prevailed pre-strike. Cold-finished bar demand also is improved though activity in this product is less marked than in hot carbon bars. Some warehouses that had been virtually out of the market for months are entering tonnage and consumers are displaying increasing interest in replenishing inventories.

Philadelphia—Mill salesmen declare that demand for hot carbon bars is far from active. If nearby deliveries were possible, the situation would be different, but there is a generally declining interest in future commitments. Many consumers have ordered into the first quarter and prefer to await developments before ordering additional tonnage. District cold drawers can offer most sizes of bars for shipment within two to three weeks, where hot material is in stock. They still have a fairly diversified inventory.

Birmingham—The two producers still operating in the southeast are scheduling their bar mills at capacity, but their combined output is not sufficient to meet the pressing demands of consumers in this area. Consumers are operating largely on pre-strike inventories and are beginning to curtail operations to conserve their dwindling supplies.

San Francisco—Continued production of bars by Fontana, Judson Steel and Pacific States Steel, plus substantial inventories in this area, indicates bar supply will be fair for the next two months.

Tin Plate . . .

Tin Plate Prices, Page 86

Pittsburgh—Dwindling tin plate inventories among major can companies likely will force curtailment in production early next month. At start of the steel strike, can companies had about 30 to 40 days' supply of tin plate and these stocks have been supplemented by continued operation at Weirton and Granite City. Mill order volume during the strike period has been below that recorded throughout September, although some relatively large individual company commitments have been booked for scheduling as soon as possible after the strike. Mills contend it will take nearly four weeks to complete shipments on old commitments after full mill production schedules are resumed.

Structural Shapes . . .

Structural Shape Prices, Page 85

New York—Structural bookings increased to 118,187 tons in September from the revised total of 98,406 tons in August. The 9-month total of 1,043,168 tons lagged some 30 per cent behind the 1,492,683 tons for the like 1948 period, reports American Institute of Steel Construction Inc.

Shipments last month of 151,346 tons compared with revised figures for August and July of 182,416 and 145,313 tons, respectively. Total shipments for the first nine months were 1,486,152 tons against 1,477,712 tons in the corresponding period last year and 1,074,145 tons for the average nine-month period for 1936-1940, inclusive.

Tonnage available for fabrication for the next four months, as of Oct. 1, was 562,211 tons against 698,230 tons a year ago and compared with 362,278 tons which represented the average for that date for the five prewar years.

Boston — Structural fabricating shops' order backlogs are slimmer and they are receiving a smaller volume of business for estimates. By fill in from warehouse, shops are mak up some ground lost during rec strikes at fabricating plants. Dur that period, plain material was ta in without interruption and m shops had substantial stocks Oct.

Philadelphia—Structural activity light. No important awards noted nor is there much in the v of inquiry. This lull may not be any special significance, apart p sibly from the advancing sea Phoenixville, Pa., shape maker expected to start rolling within week, after a slight delay.

Chicago—Fabricators have step up their trading activities, and operative effort along this line is pr ably at a high point. Various si differing with individual compan have now run short. Instances known where construction has co to a halt for lack of steel, but t is not yet common. Mills, which struck, are unable to give fabricat the word on what sizes will co first in the post-strike rollings. T probably will prevent some conce from definitely committing the selves to jobs until they know v more certainty where they sta deliverywise, after the strike's s tlement.

Los Angeles—With ending of strike of 500 sand and gravel equ ment operators, work has been sumed on major construction p ects. Structurals are virtually only steel product currently in an supply in this district, with a nu ber of fabricating shops remaining operation. Building activity con ues strong in Los Angeles Cou the total valuation of $65,369,674 permits for September showing $5 million increase over Aug Plans are being completed for new Statler Hotel in Los Ange and contracts will be awarded January for a 13-story structure c taining 1320 rooms.

San Francisco—With the excep of prospective shortages of spec ized materials, structural fabrica have fairly good supplies. No distress likely will be felt u December. Continued production four West Coast steel mills, two them in the San Francisco area, help relieve some scarcities.

Seattle—Structural fabricators port fair demand for small tonna Inventories are down and may exhausted within six weeks if East mill operations are not resumed s

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 85

Seattle—New business is not be accepted by Bethlehem Pacific C Steel Corp., due to the uncer labor situation. This plant, largest producer in this area, is The two independents North Steel Rolling Mills Inc., Seattle, Oregon Steel Mills, Portland, O are operating at near capacity.

Bar order backlogs are fair considerable business in small nages is available. Some or calling for prompt delivery have diverted. No projects involv large tonnages of reinforcing are pending.

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REPUBLIC STEEL

Tubular Goods . . .

Tubular Goods Prices, Page 88

Beaver Falls, Pa.—Babcock & Wilcox Tube Co. has issued price sheets for minimum wall, seamless, carbon steel merchant boiler tubes. The price sheets cover cold-drawn tubes in sizes 1 in. and 1¼ in. outside diameter and hot-finished tubes in sizes 1¼ in. through 6 in. outside diameter, in various wall thicknesses, with cut lengths 4 ft to 24 ft, inclusive, and in all quantity brackets. The price lists are for convenience of customers and do not represent adjustments in quotations.

Los Angeles—Pipe in diameters over 3 in. is becoming extremely tight. Many tubular items in smaller diameters have been in short supply for months. Some petroleum producers were admittedly doing precautionary buying of steel products prior to the strike, but others have been caught short. Tank needs in some instances are pressing.

San Francisco—Large pipeline projects will be hardest hit by the steel strike. Major shops which have been fabricating large diameter pipe are closed and pipe on hand for several lines is sufficient for only a few more weeks' needs.

Seattle—Inquiry for cast iron pipe is limited and no important projects are up for figures. Some small shipments are being made from inventory.

Pig Iron . . .

Pig Iron Prices, Page 84

Cleveland—Pressure for merchant pig iron is lacking with district foundries comfortably stocked and many receiving an increasing number of "hold" orders from their customers. Fabricators, having difficulty maintaining balanced component and steel inventories, are cutting production schedules. These cutbacks are backing up on castings suppliers and expectations are foundry operations will be severely curtailed within two weeks unless the steel strike is settled before then.

Philadelphia—Movement of pig iron is largely in the foundry grades, with volume in these grades fairly sustained. Despite the fact that only two furnaces are operating in this district, there are indications that some foundries are accumulating a little stock, which may cushion demand for iron once normal production is resumed. Orders for off-grade Dutch iron, totaling 7000 tons, have been placed in this district.

New York—Most district foundries are pressing less actively for pig iron. The recent upswing in foundry operations has leveled off as end-use requirements are less numerous because of increasing dislocation of schedules in metalworking industries. Considerable foreign iron is being offered here, but few sales are reported. General feeling prevails that the labor situation will be adjusted before deliveries from abroad can be made.

Three furnaces continue in operation along the seaboard. In addition, the North Tonawanda, N. Y., furnace has resumed, although most, if not all, of the iron is scheduled for the plants of its affiliated company, the American Radiator & Standard Sanitary Corp.

Pittsburgh — Amount of foundry oven coke being shipped into this district is far below requirements and is expected to force sharp curtailment in foundry operations by mid-November unless the coal strike is terminated.

Buffalo—Coke shipped in by an eastern source has aided some melters in this area. However, dwindling coke supplies are a serious threat to foundry operations. While foundries report iron supplies are shrinking, production has not been cut appreciably. The Tonawanda furnace, which was relighted a week ago, is helping to check any appreciable drop in production. Iron demand is tapering as result of the steel strike.

St. Louis—Pig iron demand soared last week as out-of-state steel mills, deprived by the strike of iron from their usual suppliers, called on this district for fill-ins. It is regarded as the last spurt before a slowdown, if the steel walkout continues. Users are feeling the iron pinch seriously and will reduce or halt operations in another 10 to 12 days. Some foundries are equally hard pressed for coke. Koppers Co. is obtaining a little coke from its St. Paul plant to tide over local iron customers. Koppers' ground stock of iron has dropped 50 per cent since the strike began, but nevertheless is ample at the present rate of sale for another two or three months.

Cincinnati—Pig iron in adequate supply is coming into this district to sustain foundry operations, but imminent shortage of coke may stifle production. Melters' backlogs are being cut due to customer hesitancy in making commitments.

Iron Ore . . .

Iron Ore Prices, Page 88

Cleveland — Only 79,830 tons of Lake Superior iron ore were shipped from upper lake ports during the week ended Oct. 24, reports Lake Superior Iron Ore Association. This compares with 2,011,646 tons for the like week a year ago. The cumulative total for the season to Oct. 24 is 68,213,203 tons compared with 72,719,328 tons for the like period a year ago. Shipments from United States ports alone have totaled only 66,717,178 so far this year, a decrease of 5,017,214 tons from a year ago.

Wire . . .

Wire Prices, Pages 86 & 87

Chicago—Distributors' nail inventories are suffering the largest inroads at present. Pressure for wire generally is not notably pronounced, so many other steel products being seriously depleted as to remove still operating wire makers from the full impact of the strike. Thus, all customers of now struck mills have not tried to place orders with operating mills as has been more widely true for other short steel products. Merchant items, such as fence, steel posts, etc., remain in fairly good supply in the field.

Alloy Steel . . .

Pittsburgh—Braeburn Alloy S Corp. and Colonial Steel Co. h been idled by the steelworkers un Allegheny Ludlum Steel Corp.'s c tract is due to expire Nov. 1. H ever, Firth-Sterling Steel & Carb Corp., Vanadium-Alloys Steel Anchor Drawn Steel Co., Jessop St Co. and Latrobe Electric Steel remain in operation. No marked provement in order volume is no by these latter interests, probably cause of an anticipated curtailm in production schedules among c tomers due to steadily dwindling st inventories.

Warehouse . . .

Warehouse Prices, Page 89

Chicago—Little flat-rolled and carbon bar stock is available fr jobbers. Demand has accelerated cold-finished bars and stainless, b being used increasingly as subs tution material. Pressure by wa houses on the still operating mills enormous, but no relief from t direction is in prospect. Mass c tailments have been avoided throu swaps, loans of steel and usage every possible scrap. Full scale o operations for a prolonged period w be required to fill emptied supp lines. Warehouses, by the time strike is settled, expect to have start from scratch to rebuild stoc before they can take care of c tomers on a normal basis.

Boston—Demand for steel fr warehouse is strong, notably for co rolled and galvanized sheets. Stoc of these grades are low. Distributo are more conservative in taking ders and in effect are allocating su plies. As inventories become deplet and unbalanced, warehouses are u certain as to replenishment. So had rather limited orders on boo when their mills suspended sh ments.

Philadelphia—Strong demand prompt tonnage is reflected in wide ing gaps in warehouse stocks. Pop lar sizes of bars and light angles a certain gages of sheets are bei depleted rapidly. Many buyers a buying off-sizes and grades as su stitutes. Various jobbers who h substantial tonnages on hand wh the steel strike began are beginni to show concern over replacemen Some look for fairly prompt sh ments once the strike is ended the theory that at least some to nage had been rolled against orders at the time mills were forc to suspend. They fear such wou be little more than a stopgap a that considerable time may elap before they will be able to get i ventories back to normal. Despi current pressure, some leading d tributors believe there is not qu the demand there was a couple weeks ago.

Pittsburgh—An increase of 5 cen per 100 lb for city delivery will put into effect Nov. 1 by warehous in this area, making the differenti 20 cents over the country price. T

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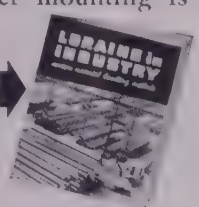

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Cleveland—Strike-swollen dem on local warehouses continue h but pressure on distributors is ticeably easier as compared with days ago. Fabricators are pullin their horns, ordering steel less tively as they run into general ventory difficulties. Some fabrica shops in this area have begu curtail operations. No actual s downs for lack of steel have beer ported and are not expected another couple weeks. Meanw warehouse stocks are being depl especially of the popular items. S delays in replenishing stocks a the strike are anticipated. A l gray market tonnage has appe here but consumers are shying a from it.

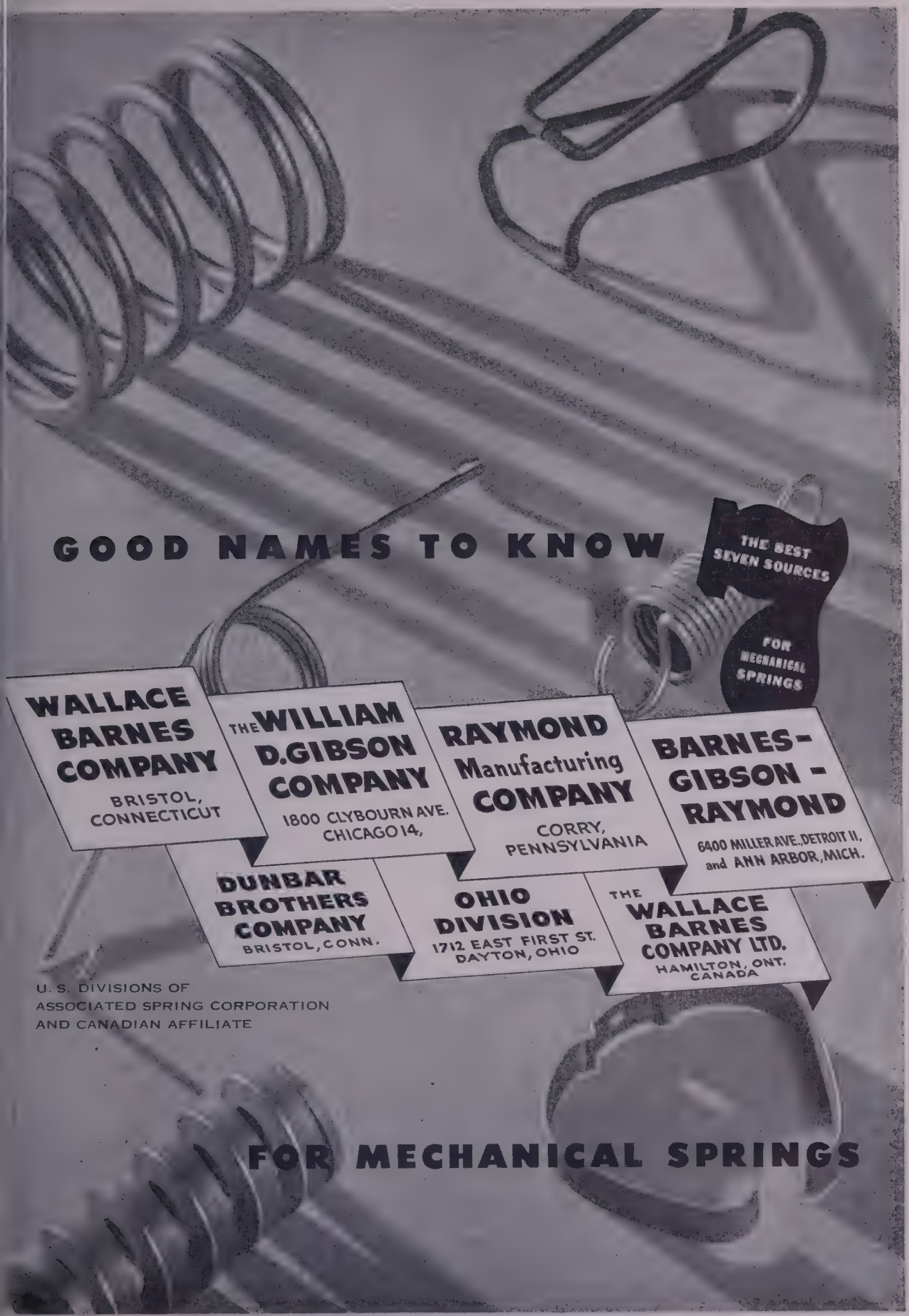
Cincinnati—Steel warehouses making deliveries as rapidly as sible in face of urgent demand. I interests are rationing supplie regular customers and are refu to deplete stocks on large ton orders normally placed with n

Detroit—Jobbers in this area been practically cleaned out stocks, particularly flat-rolled, in past four weeks, even though in tories were considerably above mal on Oct. 1. A dribble of prod is coming in from the few small m which still are operating. Bu combing warehouses for fill-in nage are being approached agai "gray market" operators, and local press has carried adver ments offering substantial quant of sheet and strip at unstated pr Buick is said to have been off 2000 tons of 20-gage cold-rolled sh for 6.5c per pound, f.o.b. Pittsbu This is only ¼-cent over the l warehouse price, although fre would bring the delivered cost to

Birmingham—Warehouses in district had reasonably good inv tories of steel at the beginning the steel strike, but shortages appearing. They have met fa satisfactorily consumers' requ ments, except for certain struct items and galvanized sheets.

Milwaukee — Outgoing shipm from warehouses this month h been tremendous. How long this will be maintained depends on rat plant closings and size of wareho stocks. On the latter point, a mi situation exists. One warehouse s that stocks are still in fairly g balance, except for sheets. Anot says that all products are disapp ing rapidly. Cold-drawn bars being used in some instances substitutes for hot. It has been p sible for one interest to supply items required for some construct jobs, even though those requireme may cover as many as 80 sizes structural material. Some of largest concerns have tried to m production requirements from wa house stocks. Failing in this, m curtailments are expected momen ily.

St. Louis—Steel warehouses and in Kansas City, Mo., are ama at the mild demand for wareho items. Consumers throughout southwest are complacent about strike. Oil companies, some of wh had ample stocks, are doing alm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FOR MECHANICAL SPRINGS

no warehouse buying. Structu shops also are buying warily. Wa house stocks, with the exception galvanized and light cold-rol sheets, are good although size asso ments could be better. Heavy h rolled sheets and plates are plenti United States Steel Supply Co. telling its Chicago customers th can be served from the St. Lo warehouse.

Los Angeles—Jobbers are alloc ing virtually all products, with exception of structurals and scatte sizes of a few other items not great demand. Supplies are extre ly short in cold-rolled and galv ized sheet, some gages of hot-rol sheet, light plate, small angles bars, and widely used diameters pipe. Warehouse inventories of ma of these items cannot last mu longer.

Seattle—Wholesalers are allocat available tonnages to regular c tomers. Demand continues active out-of-stock items, except hea plates which are slow.

Scrap . . .

Scrap Prices, Page 92

Pittsburgh—No offers to sell No heavy melting below $29 are not although further weakness in q tations is indicated should the str continue through mid-November. C rent easier price undertone may reversed following termination of strike, but this phase possibly be of short duration because of indicated reduction in ingot ope tions once steel inventory pipeli are filled. Generation of scrap tending downward and this tr will become more pronounced o the next two weeks should the str continue.

Philadelphia—One district mill ordered a small tonnage of No. heavy melting steel at $21.50, livered. Some light miscellane buying in other quarters also been at lower prices, with a res that the current spread is $21.50-$ Light buying of No. 1 heavy melt steel, which normally would be little significance, has brought market on that grade down to $ $24. No. 1 busheling is off nomina to $21.50-$22; No. 2 bundles, $19. $20. No. 1 bundles is easier at $22. $23.00, based on small sales.

Machine shop turnings, sh shovel turnings and mixed bori and turnings are unchanged; a bar crop and plate and punchi and plate scrap. Cut structurals off $1 to $25.00; electric furn bundles and heavy turnings are slightly to $24.50 and $23.00-$24 delivered, respectively.

Cupola cast is up $1 to $32.50, livered, and heavy charging box c and heavy breakable to a spread $34.00-$35.00, with the outside fig the more representative. Malleа has taken another spurt, now hold at $39.00.

New York—Brokers' buying pr on most grades of scrap are changed. Exceptions are reducti on No. 1 cupola cast to $29-$30 on No. 1 machinery to $31-$32.

Buffalo—Steady to firm tenden prevail in the scrap market des

5 correct answers to the problems of metal forming and punching

Verson offers three basic groups of press brakes — Junior Series, Intermediate Series and Major Series—to meet every requirement for forming, bending, coping, notching, punching.

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Do you have this helpful literature?

VERSON DIE MANUAL, Bulletin DM-48, is an 88 page handbook of press brake dies, punching attachments, press brakes and related information.

MAJOR SERIES PRESS BRAKE CATALOG, Bulletin MPB-48 rev., gives full design details and specifications for Verson Major Series Press Brakes.

JUNIOR AND INTERMEDIATE CATALOG, Bulletin JIB-49, gives full design details and specifications for Verson Junior and Intermediate Series Press Brakes.

Any or all of these bulletins are available on request. Please specify bulletin number of those desired.

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PRESS BRAKES • DIES • DIE CUSHIONS

the steel industry tieup. Dealer willing to do business at the strike prices subject to shipmer ter the strike. To cover addit handling costs on material pilin in yards, dealers are paying $1 less than before the strike.

Detroit—Unexpected firming prices has been noted, with purchases concluded by mills a ently in belief the market was low point which would permit aging down scrap costs. All g are up $1 with the exception o 2 bundles and cast iron. The la local mill has been laying down terial in at least three yards has close to 100 cars on track cumulating "strike demurrage," culated at a somewhat lower than the regular charges.

Cleveland—Scrap interests ar ginning to waver in their appr of the market. Prices on steel ing grades are somewhat we due to the absence of bu but are expected to remain clo present levels over the next wee 10 days. If the steel strike is ended by that time, a price de likely will develop in line with expected drop in industrial acti

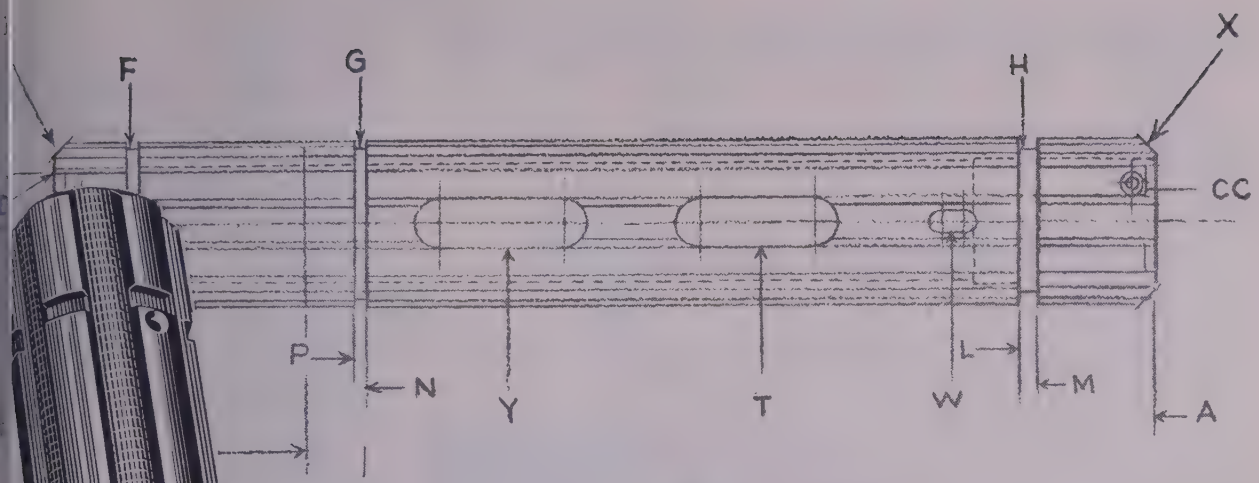
Chicago — Prices for open-h scrap are up again to about prestrike levels. Even those i ests who do not look forwar end of the strike for several w are not disposed to part with s New orders for No. 1 heavy me steel for delivery after the s were booked last week by bro The mills placing these orders ap ently agree with traders that p will soar upon settlement and buying a little "insurance" now. sensus of the trade is that N heavy melting steel and No. 1 bu list nominally now at $27-$28; 2 heavy melting, $26-$27; N bundles, $24-$25. Electric fur bundles are quotable at $27-$28 cut structurals at $28-$29.

Cincinnati—Scrap prices are changed. Mills unaffected by l troubles are taking in tonnage st ily and, despite heavy melt, are cumulating reserves. Dealers' stocks are also being augmente anticipation of an active, hi market.

Birmingham—With heavy mel holding at $25, the scrap mar except for rerolling rails and grades, is unusually quiet. Co erable stocking of scrap is repo as continued warm weather and proved prices has stimulated tr ing of material. Latest quotatio rerolling rails is $37.

St. Louis—Scrap prices are fir despite substantially better rer shipments. Rerolling and ran length rails moved $1 higher week as some dealers began a l speculative stocking in anticipa of a wave of demand when the s strike ends.

Los Angeles—Although some servers had expected that comple of Kaiser's second blast furnac Fontana would reduce that m scrap requirements, its purchase steelmaking scrap have greatly creased in recent weeks. All o major mills here are affected by shutdown and are making no s commitments.



the tube that helps pay for itself

IT takes 20 operations—from broaching to final milling—to make this tubular spline shaft. Cost of this machining sequence makes the finished shaft a stiff rejection risk . . . only quality seamless tubing can be used for the job. The tubing used in this particular instance, however, helps pay for itself in the bargain.

This dividend stems from a spec change, a new analysis recently adopted by the manufacturer on Frasse recommendation. Costing 10% extra, this tubing, through better machinability, *more* than earns back its slight additional cost.

Elapsed time of the cut-off operation, for instance, has been reduced from 1.03 to .948 minutes. Rough turning once took 3.0 minutes—now requires but 1.72. Broaching is now accomplished in one pass instead of the previous two. And 6.77 minutes of hobbing operation have been cut to 5.72—*with 30% longer tool life*, by the manufacturer's own estimate.

Frasse is a leading distributor of steel tubing—and provides a wide range of immediately available carbon, alloy and stainless analyses to work from. But equally available, and equally useful, are Frasse engineering facilities to help you use tubing to your best advantage. Call *Peter A. FRASSE and Co., Inc., 17 Grand St., New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Ave., Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange St., Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore.*

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Rails, Cars . . .

Track Material Prices, Page 87

New York—First important ca quiry in many weeks involves freight cars for the Union Pa The list comprises 2500 fifty-ton cars, 1400 fifty-ton gondola cars forty-ton stock cars, 250 fift flat cars and 100 seventy-ton dola cars. Buying is at a vi standstill.

Philadelphia — Pennsylvania road has closed on 60,000 ton rail for 1950 delivery, with Carn Illinois Steel Corp., Pittsburgh, lehem Steel Co., Bethlehem, Pa., Inland Steel Co., Chicago. The will involve 155, 140 and 133-p sections.

Chicago—Hopes that railroads be back in the market for new fr cars soon got a boost this m from a western railroad's in for 5000 units. This inquiry el a flood of estimates. There possibility that a local interest increase its building program of for its own use, but extent of has not yet been decided.

Canada . . .

Toronto, Ont.—Buying is at a ly heavy pace in Canadian steel kets and mills are fully booke production to the end of the Fresh buying move is credite the fact that the steel strike i United States may result in a s age of steel in Canada. Wareh are well stocked with steel an shortage is reported in most lin

Demand for scrap has incr sharply and the supply has tight Dealers have marked up price per ton, which brings them ba ceiling levels. Cast scrap is s and dealers are selling at $4 depending on grade.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

750 tons, Dollar Savings Bank, Gran course, Bronx, New York, to Gran Works Inc., that city.

500 tons or more, new plant Bethleh cific Coast Steel Corp., Seattle.

135 tons, braced steel tower, Foster W Co., New York, to Harris Structura Co., that city.

100 tons, Sheridan Plaza Shopping Tonawanda, N. Y., to the R. S. McM Steel Construction Co., Buffalo; S Construction Co., Buffalo, general c tor

100 tons or more, 38 towers aerial pa tramway, Mount Hood, Oregon, to P Willamette Co., Portland, Oreg.

STRUCTURAL STEEL PENDING

3100 tons, veterans hospital, Syracuse, John A. Johnson, Brooklyn, N. Y., general contract.

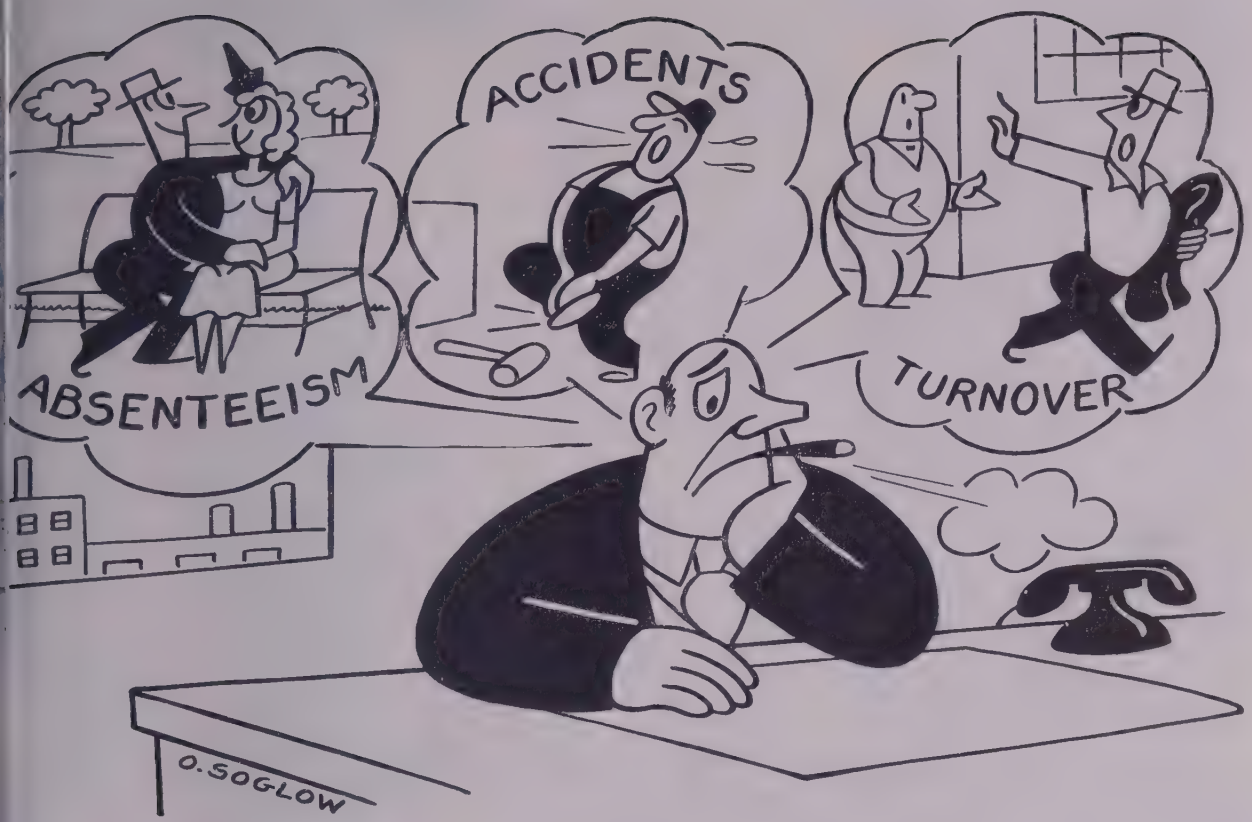
1500 tons, garage, 1515 Seventh Ave. New York; pending; Kelly & Gruzen, tects.

515 tons, section, state turnpike, We land county, Pennsylvania; bids Nov

400 tons, White Plains, N. Y., hospita tion; bids Oct. 21.

325 tons, Alaskan way viaduct, Seattle complete, bids soon.

200 tons, Lucky Peak dam project, Idah eral bids in.



1 plan helps prevent all 3

en you show the people in your com-y that you're interested in their wel-, they naturally react favorably. That's *production goes up* when you boost r employee-participation in the Pay- Savings Plan. Here's how it happens:

he more U. S. Savings Bonds an em-ee holds, the more secure he feels. more secure he feels, the greater his e of mind—the more contented, care- and productive he is on the job.

hose facts aren't just something we med up. They're borne out in the rience of more than 20,000 companies noting the Plan.

Everybody Benefits!

d sales spread the national debt, thus easing our national economic security. And, of course, what's good for the nation is good for you and your business!

The individual Bond buyer gets back $4, when his Bonds mature, for every $3 he invested. That's a boon for him, and —multiplied by millions of Bond holders —represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

Five Steps Boost Participation

1. See that a top management man sponsors the Plan.

2. Secure the help of the employee organizations in promoting it.

3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Payroll Savings Plan's benefits to them.

4. Make a person-to person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bonds Division. He is listed in your telephone directory. Wouldn't it be a good idea to call him right now, while it's on your mind?

The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

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125 tons, two bridges for Alaska Road Commission; general bids in.

REINFORCING BARS . . .

REINFORCING BARS PENDING

1500 tons, Alaskan way viaduct, Seattle; plans complete, bids soon.

100 tons, Washington state highway projects; general bids in.

100 tons, Lucky Peak dam project, Idaho; general bids in.

Unstated, transmitter building for 13th district, U. S. Navy; bids to Seattle, Dec. 9; Spec. No. 21,922.

PLATES . . .

PLATES PENDING

2600 tons, steel piling, Alaska way viaduct, Seattle; plans complete, bids soon.

900 tons, tunnel lining Lucky Peak project, Idaho; Puget Sound Bridge & Dredging Co., Seattle, and Macco Corp., Paramount, Cal., joint low bidders to U. S. Engineer, $1,169,755.

100 tons plus digester covers, Portland, Oreg., sewage system; bids soon.

Unstated, two steel storage tanks, for Northwest Glass Co., Seattle.

PIPE . . .

CAST IRON PIPE PENDING

4800 ft, 16 in. cast iron pipe, city of Allentown, Pa.; bids Nov. 16.

500 tons or more, 23,000 feet 4 to 12 inch cast iron pipe; general bids to Helena, Mont., Nov. 3; contractors to furnish materials. (50 tons in previous unit, placed with Pacific States Cast Iron Pipe Co., Portland, Oreg.)

STEEL PIPE PENDING

1000 tons, steel pipe, involving 8700 ft of 30 in. and 6500 ft of 36 in., city of Allentown, Pa.; bids Nov. 16.

800 tons, 42 in. steel water pipe, Washington, Suburban Sanitary Commission; bids opened last week. Alternates on other types of pipe also were considered.

Unstated, Pacific Water Works Supply Co., low $14,350, to Portland, Oreg.

Unstated, 7500 feet, 4 inch black steel pipe; bids to Bonneville Power Administration, Portland, Oreg., Nov. 3.

RAILS, CARS . . .

RAILROAD CARS PENDING

Great Northern, 66 passenger cars, pending; list includes 30 sleepers, 6 coaches, 6 diners, 6 coffee shop cars, 6 observation cars, 6 baggage cars and 6 baggage-mail cars.

Union Pacific, 5000 freight cars, pending; list comprises 2500 fifty-ton box cars, 1400 fifty-ton gondolas, 750 forty-ton stock cars, 250 fifty-ton flats and 100 seventy-ton gondolas.

CONSTRUCTION AND ENTERPRISE

ILLINOIS

SKOKIE, ILL.—Silver Skillet Brands Inc., 7510 N. St. Louis St., has awarded the general contract for construction of a factory and office building to Federal Constructors, 173 W. Madison St., Chicago, for approximately $180,000; A. Epstein & Sons Inc., 2011 W. Pershing St., Chicago, structural engineers.

KANSAS

JOHNSON, KANS.—City of Johnson, E. S. Hunt, city clerk, has awarded contract for a sewage treatment plant with ap nances and auxiliaries and constr sewers, manholes, etc., to Burt & B Contractors, Hutchinson, Kans., at $10 Ediger Engineering Co., 252 Laura Wichita, Kans., engineer.

LOUISIANA

SHREVEPORT, LA. — Arkansas - Lou Gas Co., Slattery Bldg., has award contract to Latex Construction Co., Ferndale St., Houston, for constructi 91 miles of 20-inch welded joint natura pipeline between the Magnolia area Perla, Ark., estimated cost $4.1 millio Anderson Bros. Corp., 707 N. Drenne Houston, for construction of 72 miles inch welded joint natural gas pipelin tween Marshall, Tex., and a point in C bus county, Ark.; and to Omaha Dre Dock Co., Omaha, Nebr., for installati the Red river and Wachita river cros The latter two contracts aggregate $3.8 lion, making the total construction tracted for about $7.9 million.

MARYLAND

BALTIMORE—Poole Foundry & Machine 1700 Union Ave., Woodberry, Md., begun erection of a 1-story addition.

BALTIMORE—Consolidated Gas & El Light & Power Co. is constructing an tion to its automotive and repair bu on Constitution street.

BALTIMORE — Manganese Reduction recently incorporated to manufacture nesium chloride, has awarded a contra a 1-story addition to the building at 39 Baltimore St., which it will occupy.

MISSOURI

ST. LOUIS—Contracts for construction $1 million plant for manufacture of mobile antifreeze and petroleum storag cilities have been awarded by J. D. S & Co., wholesale petroleum dealers, Park Ave. Murch-Jarvis Co. Inc., Locust St., has been awarded the g contract; Frank L. Thompson, 104 Adams St., Kirkwood, St. Louis, i architect.

ST. LOUIS—United States Engineer's 826 U. S. Court House & Custom H 1114 Market St., will receive bids Nov. 20 on construction and installati equipment for the East Alton pumping tion.

NEW YORK

ALBANY, N. Y.—The state of New York erect a new office building on Elk to cost $500,000.

OHIO

CANTON, O.—Ohio Steel Products Co. been chartered through attorneys Be Dreyer, 530 Renkert Bldg., Sherwood and Charles L. Moushey, to manufa and deal in steel products.

CLEVELAND—Arro Mfg. Co. has formed by William R. Gallowitz, 9623 ton Rd., Louis C. Gallowitz, Pleasant V Rd., Berea, O., and Harry Lewis, principals of the new firm. The com is in the process of developing a new pr in the automotive equipment field and pects to become active in about two mo Location of the plant has not been de upon yet.

COLUMBIANA, O.—F. C. Russel Co. plan addition to its No. 2 plant at the we edge of town to provide more operating storage space.

MANSFIELD, O.—Non-Ferrous Perma Inc. has been incorporated by the action of the Barnes Mfg. Co. of this and the Non-Ferrous Die Casting Co. London, England. It will specialize in ing castings of copper-base alloys by method of permanent molds.

OREGON

EUGENE, OREG.—Phillipson Retort Mfg plans industrial charcoal plant; Carl engineer.

HEPPNER, OREG.—E. S. McKittrick,

Angeles, has the contract for construction of $200,000 grain warehouse and elevator, replacing unit destroyed by fire, for Morrow County Grain Growers Inc.

PORTLAND, OREG.—Bids were opened Oct. 17 for proposed Kaiser-Frazer assembly plant at 79th avenue and Columbia boulevard, cost $360,000. Structure will be built for Union Pacific Railway and leased to K-F.

PORTLAND, OREG.—California Bag & Metal Co. will award contract shortly for proposed warehouse, 24th and Nicolai.

PENNSYLVANIA

ERIE, PA.—Pennsylvania Electric Co. will erect a $12.5 million addition to its Front street station. Two years will be needed for completion.

VIRGINIA

RICHMOND, VA.—Esso Standard Oil Co. plans to build a bottled gas plant and oil terminal on James river just below Deep Water terminal; cost $1.1 million.

WASHINGTON

BREMERTON, WASH. — City has awarded contract to Hall-Atwater Co., Seattle, low $197,455, for construction of disposal plant.

SEATTLE—Construction bids for a naval communication system including reinforced concrete transmitter building have been called Dec. 9 by the 13th Naval District. The project will be installed near Arlington, Wash. Specification number is 21,922.

SEATTLE—Bethlehem Pacific Coast Steel Corp. announces immediate construction of a structural steel fabricating plant to be erected on property recently acquired from Isaacson Iron Works. Plans call for a structural shop, completely equipped with forming, punching and shearing facilities for the fabrication of a wide range of steel frame structures. The facilities will include a transmission tower fabricating shop and a complete galvanizing plant. Quantities involved in this building include 500 tons or more of structurals.

SEATTLE—Fire Oct. 20 did damage estimated at $60,000 to the structural steel fabricating plant of Pacific Car & Foundry Co.

WALLA WALLA, WASH.—U. S. Engineer called bids Oct. 26 for 15 transformers, delivery in February, 1950, for McNary dam navigation locks; also Dec. 6 for four hydraulic turbines, including appurtenances, for the same project.

CANADA

LONDON, ONT.—Frid Construction Co. of Hamilton has been awarded the general contract for the superstructure of the new General Motors diesel locomotive plant. Frid company earlier was awarded the foundation contract on the job.

NEWMARKET, ONT.—Office Specialty Mfg. Co. announces plans to erect a steel fabricating plant to be in operation next spring.

FERROALLOYS

(Concluded from Page 89)

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., 1% max.), $3. **Primos and High Speed** (Va 35-55%, Si 1.50% max., C 0.20% $3.10.

Grainal: Vanadium Grainal No. 1, 93c; 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carloa $1.20 per lb of contained V_2O_5, freig lowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10, W or more, $2.25 per lb of containe 2000 lb W to 10,000 lb W, $2.35; less 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Co or spot, 1000 lb or more, $2.90 per lb o tained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, 43%, Fe 40-45%, C 0.20% max.). Co c.l., lump, bulk 6.6c per lb of alloy, c.l. 7.35c, ton lot 8.1c, less ton 8.95c. Deli Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, 52%, Fe 8-12%, C 0.50% max.). Co carload, lump, packed 20.25c per lb of ton lot 21c, less ton 22.25c. Freight al Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% Al 0.50% max., C 0.50% max.). Co 100 lb or more, 1" x D, $1.20 per lb loy. Less than 100 lb $1.30. Delivered. add 5c. F.o.b. Washington, Pa., price lb and over are as follows: Grade A 14% B) 75c per pound; Grade B (14-18 $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4. lb contained B, f.o.b. Philo, O., with f not to exceed railroad freight allowed t tination.

Bortam: (B 1.5-1.9%). Ton lots, 45c p smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net t carload, 8c per lb, f.o.b. Suspension B N. Y., freight allowed same as high-c ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Mn 5% Si 8% max., C 0.5% max.). Contract, to 2" x D, $2.90 per lb of contained Cb, le $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; N Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 1.25%, C 3.50-5%). Carload, 12 M x D load packed 19.0c per lb of material, t 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al Zr 3-5%, Ti 9-11%, B 0.55-0.75%). C packed. 1" x D, 43c per lb of alloy lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr Fe 20% approx.). Contract, carload, p ½" x 12 M, 16.5c per lb of alloy, to 17.50c, less ton 18.5c. Delivered. Spot 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, 11%). C.l. packed, 17.00c per lb of allo lots 18.00c; less ton lots 19.50c, f.o.b. Ni Falls, N. Y.; freight allowed to St. Lou

V-5 Foundry Alloy: (Cr 38-42%, Si 17 Mn 8-11%). C.l. packed, 14.25c per alloy; ton lots 15.75c; less ton lots 1 f.o.b., Niagara Falls, N. Y.; freight al to St. Louis.

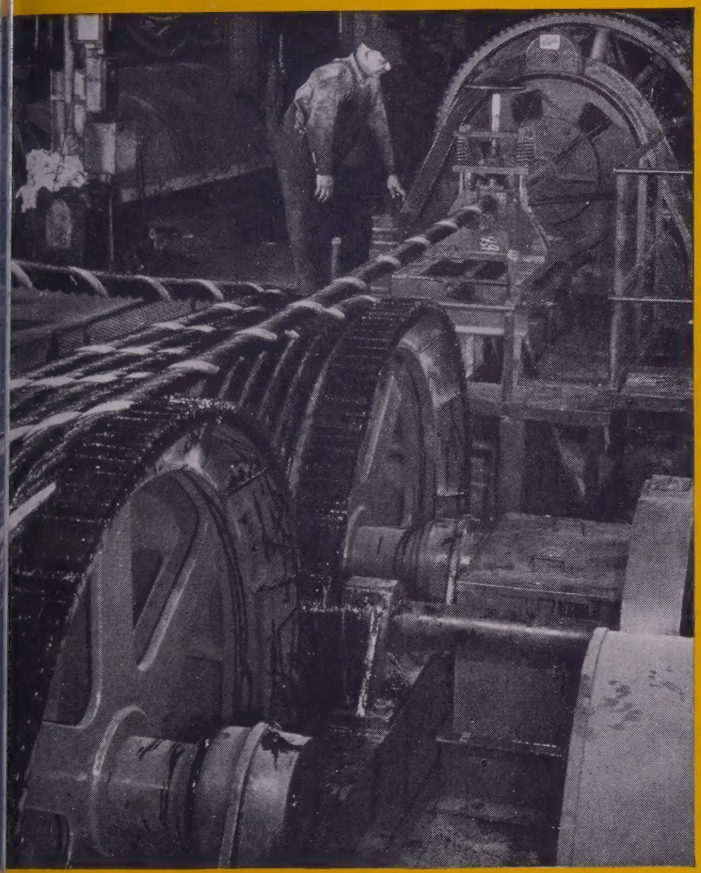
Simanal: (Approx. 20% each Si, Mn, Lump, bulk, carload 11.00c. Ton lots, 11.50c, packed 11.75c. Less ton lots, p 12.55c per lb of alloy, f.o.b. Philo, O., freight not to exceed railroad freight al to destination.

Ferrophosphorus (23-25% based on 24% tent with unitage of $3 for each 1% above or below the base); Gross tons pe load, f.o.b. seller's works, Mt. Pleasa Siglo, Tenn., $65 per gross ton.

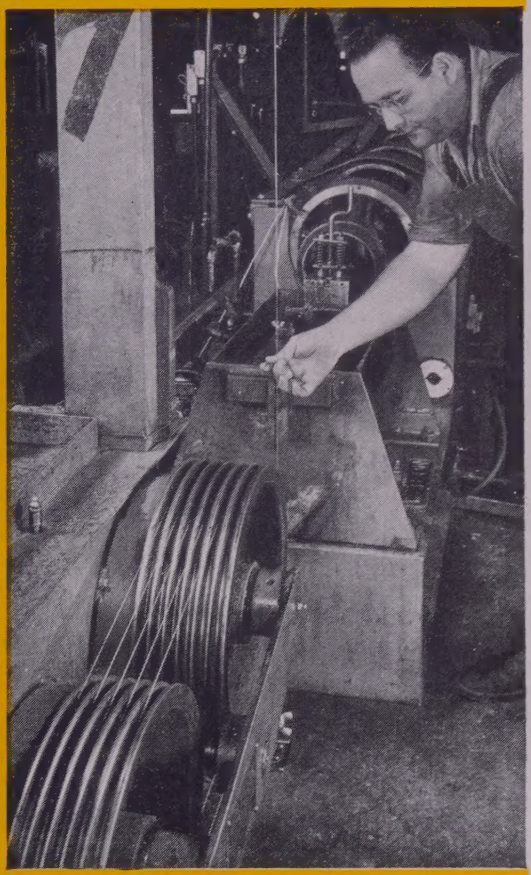
Ferromolybdenum: (55-75%). Per lb, tained Mo, f.o.b. Langeloth and Washi Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, con Mo., f.o.b. Langeloth and Washington, packed in bags containing 20 lb of denum, 95.00c.

This photograph shows a 3⅛" diameter Monarch Whyte Strand Wire Rope coming off a Macwhyte closing machine. Weight of this rope is approximately 16.65 pounds per foot. It has a strength of approximately 392 tons and is used for the digging line on large dragline excavator with 35 cu. yd. bucket.



In this photograph is a 3/64" diameter Stainless Steel Cord coming off a Macwhyte closing machine. It weighs approximately 0.35 lbs. per 100 feet; has a strength of approximately 270 pounds, and is used for many small cord needs.



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LARGE WIRE ROPE or SMALL WIRE CORD

make your selection from

You will get smoother operation and better service when you use the wire rope designed and manufactured to meet your requirements.

Macwhyte engineers are always glad to suggest the correct Macwhyte rope or cord best suited to your needs.

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MACWHYTE COMPANY

2912 Fourteenth Avenue **Kenosha, Wisconsin**

Manufacturers of Monarch Whyte Strand PREformed, Internally Lubricated Wire Rope, Atlas Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope.

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a thousand and one

WIRE ROPES

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MACWHYTE

Behind the Scenes . . .

It's Cat Time

Although we managed to pick up a few scratches several years ago when we broached the subject of cats in this column, we will be real brave and point out that this is National Cat Week. Seems more logical that last week should have been picked, what with all the witches, broomsticks and cats we saw around. And since all the rest of the atmosphere of the twenties seems to be blossoming, we should probably be right in tune with the times if we tell you that STEEL is the cat's pajamas.

We Get Around

According to the Chicago Tribune (as reported by *New Yorker*) President Truman has given Etaoin Shrdlu orders to put the heat on Democratic Senators. The *New Yorker* further comments, "Hell, we've known Shrdlu all our life. He couldn't put the heat on a stove." As yet, we can't decide to sue whom for what, because we aren't sure whether we've been insulted. One thing we know is that although we have shaken hands with Harry on a couple of occasions, we didn't receive the orders from him that the Trib said we did. On the other hand, we have been trying to figure out which New Yorker has known us all of our life. That business about the stove is something else again. With the janitor of the Penton building applying the heat, our orange crate desk under the steam pipes is getting mighty warm, and we're about ready to blow a gasket, which should put the heat on something by osmosis.

No News Now

Ten days from the day this is being written, you'll be reading it (if your copy of STEEL reaches you on the date of issue). Somewhere within the next three of four days a news story will develop. Might be the end of the coal or steel strike. Might be a widespread shutdown of industry due to steel or coal shortages. Might even be entirely out of the labor picture. Whatever it is, wherever it is our news staff will be there to cover it. They'll follow it along until it reaches conclusion, or at least until press time. There will be rewrites to be done, layout to be made, possibly charts to be drawn. Within a matter of hours the whole job will be wrapped up, transformed from a group of ideas into a printed page and bound into a copy of STEEL, headed for you. It would be very nice if we could tell you what it will be all about, but the whole point to the story is that we just went up to see the news editors. "What," we asked, "do you folks have cooked up for the November 7 issue?" "Haven't the slightest idea", came the reply.. Which, to our way of thinking, was a very good answer from your standpoint, and from theirs. The only flaw in the whole picture is that it gives us nothing to write about. No special reports in this issue, no long range planning jobs, nothing but top-notch coverage of the latest news in industry, just as it will be made during the days before we go to press.

Even in Utah

Out in Utah the sharp eyes of C. E. Beveridge are working again. He has sent us another mention of Shrdlu in the public prints. This time it appeared in a story about the French political situation, probably referring to one of our French cousins. One of our ambitions is to find it appearing in STEEL, anywhere but on this page. Never have succeeded yet, because our proofreaders have pretty sharp eyes. Even though our publication operates virtually on a newspaper schedule, it's hard to get any slips past the editors and the proof room. Some day we'll catch them, though!

Puzzle Corner

Hope you all found that the gear tooth will hit the vertical position four times as it goes around the large gear. This week we are going to the local butcher for a shady deal. He's an old fashioned character who still uses weights and a balance. We bought a big turkey, which weighed 20¼ pounds. For some reason, it didn't look quite that big to us, so when the butcher wasn't looking, we weighed it ourselves, putting the turkey where the weights had been and the weights where the turkey had been. We found it weighed only 16 pounds. Can you tell us what was the actual weight of the bird?

Shrdlu

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Also publisher of
THE FOUNDRY • MACHINE DESIGN
NEW EQUIPMENT DIGEST

Member, Audit Bureau of Circulatio
Controlled Circulation Audit, Inc.; a
National Publishers' Association.

Published every Monday. Subscription
the United States and possessions, Ca
ada, Mexico, Cuba, Central and So
America, one year $10; two years $1
all other countries, one year $18. Sin
copies (current issues) 35c. Entered
second class matter at the postoffice
Cleveland, under the Act of March 3, 18

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